Northern Transport Corridor Initiative: Assessment Report

Rosalind Kirika
Christine Onyango

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Rational Pharmaceutical Management Plus Program
Center for Pharmaceutical Management
Management Sciences for Health
4301 North Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Telephone: 703-524-6575
Fax: 703-524-7898
E-mail: rpmplus@msh.org

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About RPM Plus

The Rational Pharmaceutical Management Plus (RPM Plus) Program, funded by the U.S. Agency for International Development (cooperative agreement HRN-A-00-00-00016-00), works in more than 20 developing countries to provide technical assistance to strengthen pharmaceutical and health commodity management systems. The program offers technical guidance and assists in strategy development and program implementation both in improving the availability of health commodities—pharmaceuticals, vaccines, supplies, and basic medical equipment—of assured quality for maternal and child health, HIV/AIDS, infectious diseases, and family planning and in promoting the appropriate use of health commodities in the public and private sectors.

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Rational Pharmaceutical Management Plus Program
Center for Pharmaceutical Management
Management Sciences for Health
4301 N. Fairfax Drive, Suite 400
Arlington, VA 22203
Telephone: 703-524-6575
Fax: 703-524-7898
E-mail: rpmplus@msh.org

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ACRONYMS

AMPATH	Academic Model for the Prevention and Treatment for AIDS
ANC	antenatal care
ART	antiretroviral treatment
ARV	antiretroviral [medicine]
CSW	commercial sex worker
DASCO	District HIV/AIDS and STI Control Officer
DH	district hospital
DHMT	District Health Management Team
ELISA	enzyme-linked immunosorbent assay
FHI	Family Health International
GOK	Government of Kenya
HC	health center
HIV/AIDS	human immunodeficiency virus/acquired immune deficiency syndrome
IEC	information, education, and communication
JICA	Japan International Cooperation Agency
JSI	John Snow, Inc.
KEDL	Kenya Essential Drugs List
KEMRI	Kenya Medical Research Institute
KEMSA	Kenya Medical Supplies Agency
KES	Kenyan shilling(s)
MEDS	Mission for Essential Drugs and Supplies
MIMS	*Monthly Index of Medical Specialties*
MOH	Ministry of Health
MSF	Médecins Sans Frontières
MSH	Management Sciences for Health
MTRH	Moi Teaching and Referral Hospital
NASCOP	National AIDS and STI Control Program
NGO	nongovernmental organization
NVP	nevirapine
OI	opportunistic infection
PEP	post-exposure prophylaxis
PGH	provincial general hospital
PLHA	people living with HIV/AIDS

PMTCT	prevention of mother-to-child transmission
REDSO	Regional Economic Development Services Office
RPM Plus	Rational Pharmaceutical Management Plus [Program]
RPR	rapid plasma reagent [test for syphilis]
SDH	sub-district hospital
SIDA	Swedish International Development Agency
STGs	standard treatment guidelines
STI	sexually transmitted infection
TB	tuberculosis
TTCA	Transit Transport Coordination Authority
USAID	United States Agency for International Development
VCT	voluntary counseling and testing
VDRL	Venereal Disease Research Laboratory [test for syphilis]

EXECUTIVE SUMMARY

At the request of the U.S. Agency for International Development (USAID) Regional Economic Development Services Office (REDSO) for East, Central, and Southern Africa, the Rational Pharmaceutical Management Plus (RPM Plus) Program collaborated with Family Health International (FHI) to conduct an assessment of three Northern Transport Corridor "hot spots" located in Busia, Malaba (Western Province), and Mariakani (Coast Province) in Kenya. Management Sciences for Health (MSH)/RPM Plus's contribution to the assessment was to examine commodity management practices in health facilities with a view to providing additional information that will support design of interventions, identification of community leaders and mechanisms for involving the community to promote ownership and sustainability, and identification of potential partners among the HIV/AIDS programs on the ground.

The assessment examined commodity management systems and practices in 20 facilities ranging from public district hospitals to private pharmacies. Clients at these facilities in all three hot spots were mainly from the local community, although individual facilities along the Northern Transport Corridor were found to serve a number of truck drivers and commercial sex workers. The most common diseases treated at these facilities were malaria, diarrhea, respiratory tract infections, and sexually transmitted infections (STIs). Communities are poor, with individual adults earning between 500 Kenyan shillings (KES) and KES 1,000 per month. Common occupations of residents of these communities are subsistence farming, boda boda (bicycle/small motorcycle taxis) trade, hospitality industry, and retail trade among others.

Facilities assessed were generally found to have good availability of commodities for treating STIs and opportunistic infections, with most health facilities and pharmacies having at least 50 percent of tracer items needed to treat these conditions. However, there were consistent reports of stock-outs of certain products, such as Determine and Uni-Gold test kits used for voluntary counseling and testing (VCT). Stock-outs of commonly used STI medicines were attributed to the inappropriateness of the STI kit system. Private pharmacies tended to have better availability of tracer items than health facilities.

Virtually all facilities assessed lacked access to the Kenya standard treatment guidelines and the Kenya Essential Drugs List to inform selection and procurement of health commodities. Procurement mechanisms tend to be protracted at public facilities, with lead times being as long as four months for some products. Antiretroviral treatment programs run by nongovernmental organizations tended to have highly vertical procurement and distribution systems. Quality problems were reported for certain items and were more common at public health facilities. A certain manufacturer was consistently named as providing poor-quality products.

Problems with storage centered around sufficiency of space and control of storage temperatures, with most facilities lacking means such as air conditioning and fans to ensure optimal temperatures for storing health commodities. Power outages and fluctuations were reportedly frequent among facilities, and yet most of them lacked standby generators.

Record-keeping practices were suboptimal at many places. Bin cards were scarcely used, and in most facilities, registers were used for antibiotics but not for other medicines. Prescriptions were seldom used, and no facilities tracked storage temperatures.

With respect to rational use, patients appear to be bypassing medical consultation and instead may be buying medicines from private pharmacies directly and without a prescription. Many facilities lack sufficient numbers of qualified personnel to provide health services to the community. Few providers have undergone STI training recently or at all, and most facilities lack government guidelines and standard pharmaceutical reference materials to guide prescribing and dispensing.

A number of hot spots were identified as requiring interventions to enhance the capacity of facilities in these areas to provide HIV/AIDS-related services. Possible interventions include:

- Selection
  - Disseminate Government of Kenya (GOK) guidelines to guide diagnosis as well as selection of commodities

- Procurement
  - Streamline mechanisms to reduce lead times
  - Monitor suppliers and revisit suppliers providing substandard products
  - Advocate with GOK to implement elimination of kit system to improve availability of STI medicines in public facilities

- Storage
  - Improve infrastructure to increase storage space
  - Provide technical assistance and training in better storage practices
  - Provide equipment for controlling temperatures

- Record-keeping
  - Provide training to introduce appropriate record-keeping practices
  - Provide training and supportive supervision to assist facility staff in learning how to use information generated from records to quantify and manage commodities

- Prescribing
  - Provide training for prescribers in good prescribing practices

- Dispensing
  - Provide training in good dispensing practices and supportive supervision for dispensers
  - Provide dispensing triangles

Opportunities may also be explored for improving commodity management in HIV/AIDS-related services through public-private partnerships with private pharmacies, private health clinics, and trucking companies.

INTRODUCTION

Background

The Northern Transport Corridor links landlocked countries in East and Central Africa (Rwanda, Burundi, Uganda, Democratic Republic of Congo, and Kenya). The Corridor also links Mombasa (Kenya) to Northern Tanzania and Southern Ethiopia through Isiolo and Moyale (Kenya) and through Southern Sudan.

The Northern Corridor Transit Agreement is a multilateral treaty established in 1985 to facilitate coordination in transportation activities among countries along the Northern Transport Corridor. Created to administer this treaty, the Transit Transport Coordination Authority (TTCA) has, among other activities, an HIV/AIDS program focused on mitigating the impact of the HIV/AIDS epidemic along the Northern Transport Corridor. The objectives of the TTCA HIV/AIDS Program are to improve the capacity to monitor the impact of HIV/AIDS along the Northern Transport Corridor and to collaborate with regional and national bodies to implement activities aimed at mitigating the impact of the epidemic.

The U.S. Agency for International Development (USAID) Regional Economic Development Services Office (REDSO) entered into a collaboration with the TTCA and other partners working on multisectoral HIV/AIDS programs in East and Central Africa to introduce an innovative approach to "create and strengthen synergies among the implementing partners to effectively respond to priority needs of populations living along the Northern Transport Corridor, within the context of the USAID HIV/AIDS Program."[1] The new approach is called the Transport Corridor Initiative.

In implementing the work, it was agreed by FHI (the lead organization in the partnership) and the other partners that an assessment be conducted to inform the development of activities to mitigate the HIV/AIDS epidemic along the Northern Transport Corridor. The overall objectives of the general assessment were to:

- Add to existing knowledge about the high-risk environments of border crossings and trade towns along the Northern Transport Corridor where interventions are planned
- Collect essential data necessary to plan interventions
- Identify key community leaders and essential partners
- Involve target communities to maximize ownership

Because a range of health commodities are necessary to ensure proper functioning of HIV/AIDS services in the context of the planned interventions, a commodity management element was

[1] Statement of collaboration among implementing partners working on HIV/AIDS programs in East and Central Africa.

incorporated into the assessment. This report contains the results of the commodity management element.

The commodity management component of this assessment aimed to build on the preliminary mapping and research already conducted by the University of Nairobi/University of Manitoba Strengthening STD/HIV Control Project in Kenya. The results will be used to help establish possible interventions related to promoting access to and availability of health commodities used in HIV/AIDS and related services, such as medicines and rapid HIV test kits, along the Northern Transport Corridor.

This commodity management assessment was not intended to be detailed or exhaustive. Rather, it aims to provide an overall picture of the facilitating factors and obstacles for health providers and clients regarding accessing and using appropriate, quality health commodities. Major areas to be examined were the availability of basic health commodities, the quality/quantity of staff who handle commodities, the practices used in managing these commodities, and the appropriate use of these commodities by patients. Information obtained from this part of the assessment is intended to provide a basis for determining appropriate interventions at the selected sites, in collaboration with other Northern Transport Corridor partners.

Goals and Objectives of Commodity Management Assessment

The main goal of the commodity management assessment was to identify feasible interventions for improving commodity management practices in HIV/AIDS-related health services in targeted Northern Transport Corridor sites.

The objectives of this part of the assessment were as follows:

- To learn about commodity management practices at targeted facilities providing HIV/AIDS-related services in Northern Transport Corridor “hot spots” within Kenya
- To determine problems or gaps in commodity management practices at targeted facilities
- To identify institutional and environmental factors that inhibit or facilitate commodity management at target facilities
- To determine the potential for improving and expanding provision of commodities used in HIV/AIDS-related services at sites in the target community
- To gather data that can contribute to the development of interventions to improve commodity management practices in targeted sites in Northern Transport Corridor hot spots

Targets of the Commodity Management Assessment

Previous research had identified that most Northern Transport Corridor sites had both private and public health facilities and pharmacies, as well as a variety of nongovernmental organizations (NGOs) that provide basic health services to members of the community. It was agreed that data would be sought from managers and/or workers at key facilities and organizations providing health services at these sites. If no formal health services existed, the assessment would target places where informal health services are commonly sought in the community. The goal was to gather data from four or five facilities per hot spot.

Time Frame

Data collection took place on January 18–22, 2005.

Methodology

A semi-structured assessment tool was prepared to facilitate collection of data from sites and from key informants. Additionally, prescription reviews were conducted using a prescription checklist in facilities that used and retained copies of prescriptions. Where possible, observation of dispensing practices was done using a dispensing checklist. Data collectors also used direct observation at selected facilities to gain insight into commodity management practices.

ASSESSMENT FINDINGS: BUSIA DISTRICT

Community Characteristics[2]

Busia District is located in the Northern Transport Corridor on the border between Kenya and Uganda. It is one of the nine districts of Western Province. Busia District has six divisions and four political constituencies.[3] The district has 78 health facilities, of which 28 are government facilities and 50 are nongovernmental facilities. Thirty-five of these facilities provide the bulk of health services.

Nine health facilities in Busia District have preventive care centers that provide HIV/AIDS-related services, and 11 facilities offer voluntary counseling and testing (VCT). Three facilities offer antiretroviral therapy (ART).[4] The population seeks health care mainly from government health facilities (particularly from Busia District Hospital) and fewer go to private clinics or to the private nursing home. Some patients go directly to pharmacies, particularly if they are experiencing similar symptoms as past illness episodes and they recall the medicines previously prescribed.

The majority of residents in Busia town seek medical care at the Busia District Hospital (DH). There are fewer than 20 private pharmacies in Busia District, of which fewer than 10 are officially registered.[5] Residents obtain medicines mainly from private pharmacies and from pharmacies contained within health facilities (both public and private). Busia residents also obtain medicines from private pharmaceutical vendors, community pharmacies established under the Bamako Initiative, and herbalists.

Truck drivers and commercial sex workers (CSWs) are numerous in Busia District. Key informants felt that CSWs are quite mobile and could be moving away from focusing on roadside lodging areas to working in outlying estates and villages. Many Ugandan women working as CSWs travel between Uganda and Kenya.

At least nine programs currently provide HIV/AIDS-related services in Busia District. These include:

- Pathfinder International, which provides home-based care in collaboration with Médecins Sans Frontières (MSF)

[2] The data collection team for Busia District consisted of Ms. Christine Onyango, MSH/RPM Plus, and Dr. Brian Maiyo, consultant to MSH/RPM Plus. Key informants were Mr. Simon Danda, District HIV/AIDS and STI Control Officer (DASCO), and Dr. Stanley Nganga, District Pharmacist.

[3] The six divisions are Busia Township, Nambale, Butula, Matayos, Funyula, and Budalangi. Each political constituency is represented by a member of parliament. Busia District's constituencies are Nambale (which covers Busia Township, Nambale, and Matayos), Butula, Funyula, and Budalangi.

[4] Facilities currently offering antiretrovirals are Busia District Hospital, Nangina Mission Hospital, and Mukhobola Health Center. Tanaka Nursing Home and Port Victoria District Hospital will begin offering antiretrovirals soon.

[5] These numbers are subject to change because the number changes as some pharmacies close and others open. This information was provided by the District Pharmacist based at the main pharmacy at Busia District Hospital.

- Action Aid, which carries out advocacy and prevention activities in outlying areas
- Family Health International (FHI), which provides budget support, VCT counselor training, and quality assurance/quality control in laboratory services
- MSF Spain, which provides ART and prevention of mother-to-child transmission (PMTCT) services, as well as laboratory support for the ART program; also coordinates an HIV/AIDS information center within Busia District
- AMKENI, which provides technical assistance for integrating reproductive health with HIV/AIDS services and provides training of VCT counselors and animators
- World Vision, which provides for education of traditional birth attendants and may coordinate ART in the future
- Rural Education and Economic Empowerment Program, which provides home-based care and services for orphans and vulnerable children
- African Development and Education Organization, which provides prevention and advocacy
- Institute for Christian Studies, a German Christian organization, which carries out advocacy and coordinates programs in schools

Facility Characteristics

Busia District Hospital [6]

The 140-bed Busia DH is located within the main town of Busia, about 500 meters from the main road leading to the Kenya-Uganda border. A large number of residents and visitors to Busia District seek services from Busia DH, contributing to a high workload for the staff. Some clients come from as far as Bungoma District, Siaya District, Teso District, and even Uganda.

The majority of patients seen at Busia DH are reported to be farmers (sugar cane and cotton for cash and maize for subsistence), fishermen, commercial sex workers, boda boda (bicycle/small motorcycle taxi) operators, and hawkers of various goods.

Although some truck drivers do seek services here, it is difficult to distinguish them from other patients. When asked whether truck drivers were one of the key client groups at Busia DH, the assessment team was told that they "disappear into the slums." Apparently, truck drivers have a hierarchy that dictates where they sleep, seek health services, and so on, with "turnboys" (assistant drivers) sleeping and operating around the highway (near to or in the trucks) and truck drivers traveling further away from the road. On the other hand, a key informant mentioned that

[6] Key informant: Mr. Simon Danda, Clinical Officer and District HIV/AIDS and STI Control Officer.

truck drivers might prefer to access VCT at Busia DH because it is far from their home areas. Long waiting times are believed to deter truck drivers from seeking services at Busia DH.

Most patients seeking services at Busia DH are poor, with the average income of patients at the hospital thought to be between 1,500 Kenyan shillings (KES) and KES 3,000 per month.

The top health conditions seen at Busia DH are malaria, respiratory infections, and diarrheal disease. Other common conditions treated at the hospital are HIV/AIDS-related opportunistic infections, immunizable diseases in children, accidents, and skin diseases. It is reported that 60 percent of inpatients at this facility are HIV-positive. In Busia, the prevalence rate for HIV/AIDS (based on sentinel surveillance) is 15.5 percent. Figures from VCT services in the fourth quarter of 2004 show a 35 percent prevalence of HIV among males tested and a 35.7 percent prevalence of HIV among women tested.

The hospital operates 24 hours per day, 7 days per week. This facility has no casualty department. Patients requiring post-exposure prophylaxis (PEP) for suspected exposure to HIV that occurs on the weekend have to wait until Monday to be treated, as there are no ART services on the weekend and therefore no emergency access to PEP pharmaceuticals outside of the ART program.

The HIV/AIDS center coordinated by MSF operates from 7:30 AM to 6:00 PM. Patients begin queuing as early as 6:30 AM. Busia DH has 24-hour access to electricity and has an automatic standby generator, which is currently functioning well and is dedicated to the hospital. The facility also has 24-hour access to running water, although it occasionally experiences disconnection of water supply due to unpaid bills.

This facility has fixed telephone lines. Celtel and Safaricom networks are accessible within Busia town. No internet access is available at the hospital. The ART program run by MSF uses mainly radios and mobile phones for communication.

The national cost-sharing program was officially abolished in 2003 after a change in administration; patients now pay a registration fee of KES 20, which covers all services. Services such as malaria treatment and any consultation and treatment for children under five are free of charge. Antenatal care (ANC) and treatment for prisoners is also free of charge.

HIV/AIDS-Related Services

The HIV/AIDS-related services provided at this facility are:

- VCT
- Condom distribution
- PMTCT
- Diagnosis and treatment of sexually transmitted infections (STIs)

- Diagnosis, treatment, and prophylaxis for opportunistic infections (OIs)
- ART
- Home-based care
- Nutrition support
- Information, education, and communication (IEC) through videos shown at the VCT center
- Referral for support services in the client community

The District HIV/AIDS and STI Control Officer (DASCO) for Busia District is in charge of STI and HIV/AIDS IEC in the community. The DASCO coordinates a "stakeholders' forum," which develops a joint annual plan for HIV/AIDS services with all stakeholders working in Busia District. MSF chairs the subcommittee on ART for this forum.

VCT

The VCT center at Busia DH started operating in 2001. In 2004, 13,152 clients were tested at the VCT center, of whom 4,186 were HIV-positive. This is an average of about 253 clients per week, or 50 clients per day. The VCT center is a Government of Kenya (GOK) operation and is staffed by government workers. The center is located on the hospital grounds on the same floor as the ART program run by MSF. There is a strong link between the VCT center and the ART program, and clients who test positive for HIV at the VCT center are immediately referred to the ART clinic.

Commodities used at the VCT center include HIV test kits (Determine™ HIV-1/2, Uni-Gold™ HIV 1/2, and OraQuick™; although it is the tiebreaker in the national testing protocol, Capillus™ is not used at this facility), lancets, chase buffer, gloves, and condoms. Four out of five of the VCT tracer commodities were available at the VCT center. Because serial testing uses fewer kits, GOK operations recently switched from parallel to serial testing to alleviate the problem of shortages.

The VCT center used to perform enzyme-linked immunosorbent assay (ELISA) tests and therefore used ELISA test kits (Enzygnost™ and Vironostika™) until the ELISA machine broke down in 2004. It was taken to the National AIDS and STI Control Program (NASCOP) in April 2004 for repair, but it is currently still not functioning. HIV test kits are stored in the district laboratory on the hospital premises, where storage conditions are reported to be adequate

Busia DH has experienced shortages of various VCT commodities during the past year. There was a shortage of lancets in June/July 2004. Shortages of Determine and Uni-Gold test kits lasting as long as 90 days were a common occurrence in 2004. Only 25 OraQuick test kits have been supplied by the Kenya Medical Supplies Agency (KEMSA); OraQuick is believed to have low sensitivity and is therefore seldom used. Wastage of chase buffer has been reported, resulting from a lack of skill of VCT counselors administering tests.

John Snow, Inc. (JSI), in collaboration with KEMSA, is major supplier of HIV test kits used at the VCT center. MSF also provides HIV test kits and has proven to be a highly reliable backup source of supply. MSF also supplies kits directly to nine other VCT centers in the district. The key informant felt that the VCT program at Busia DH would not function without this backup supply source from MSF.

Condom Distribution

KEMSA provides male and female condoms to Busia DH, which in turn issues these to a number of institutions or groups in the district. In the third quarter of 2004, 216,000 male condoms were received by Busia DH from KEMSA and 66,000 were distributed to hotels, bars, and dispensers in the community. Young people from youth groups assist by collecting both male and female condoms and helping distribute them in the community. In the same period, 4,000 female condoms were received and 3,000 were distributed to community-based distributors and ANC clinics.

PMTCT

Since 2004, the ART program coordinated by MSF has provided PMTCT services through distribution of nevirapine (NVP) to HIV-positive mothers and their newborns.

In the last quarter of 2004, 796 mothers visiting ANC clinics were counseled and tested for HIV. Of these, 118 tested positive (14.8 percent). Of these, 27 mothers received NVP tablets and 18 babies received NVP suspension. Fifty mothers presenting for delivery at the DH were counseled and tested during the same period, and of these, 14 tested positive (28 percent). Of these, six mothers and seven babies received NVP.

Previously, starting in 2000, NVP had been distributed to mothers and babies through the main pharmacy at Busia DH. However, the supply to this program was erratic, and by the time of the assessment, the main pharmacy had not been supplied with NVP for over one year. In the absence of the PMTCT program run by MSF, Busia DH would be unable to provide PMTCT services. MSF obtains NVP from its central warehouse in Nairobi. The pharmacist in charge of the main pharmacy of the DH expressed the desire to have NVP available for dispensing by the main pharmacy at the DH.

The PMTCT program run by MSF dispenses NVP tablets for mothers and suspension for babies. NVP suspension is used for several months after the bottles are opened, contrary to good pharmaceutical practice. In the past, inadequately kept records led to poor quantification for NVP needs, which led to stock-outs. The program has had to resort to “borrowing” NVP from Kakamega Provincial General Hospital (PGH) to cope with stock-outs.

Diagnosis and Treatment of STIs

A total of 15,184 STI cases were seen at Busia DH in 2004.

Both the MSF-run ART program and the main pharmacy at Busia DH use and dispense STI commodities. The main pharmacy was found to have 88.8 percent of the items on the STI tracer

list, whereas the MSF program had 55.5 percent of such items in stock. This may be explained by the fact that many STI medicines are supplied to the main pharmacy by the Swedish International Development Agency (SIDA) through the Mission for Essential Drugs and Supplies (MEDS).

SIDA had sought to establish a revolving drug fund at Busia DH in order to improve availability and affordability of items on the Kenya Essential Drugs List (KEDL). The fund was to be established through a seed fund for purchasing essential generic medicines, and the DH would replenish the fund by charging patients reasonable prices for the medicines. SIDA also supplies laboratory equipment and reagents. Unfortunately, this revolving fund concept may not achieve its full potential. The government's policy was changed in 2003 to prohibit health facilities from charging patients for many medicines, which has made it difficult to implement this scheme.

The supply mechanism SIDA has put in place to supply Busia DH is highly reliable and minimizes the occurrence of stock-outs. SIDA places one order per year, and consignments are delivered on a quarterly basis. The first shipment of SIDA items arrived in late October 2004, and the second shipment was received in late December 2004.

KEMSA also supplies STI commodities through the GOK STI program. Most of the medicines supplied are antibiotics. Examples of pharmaceuticals supplied include sulfadiazine, ciprofloxacin, clotrimazole cream, and paracetamol syrup—medicines that used to be difficult to find at the district hospitals but are now available.

The kit system has had a negative impact on the supply of STI commodities. The standard composition of the kits consistently results in oversupply of uncommonly used items and the undersupply of popular or "fast-moving" ones. For example, ceftriaxone, metronidazole, spectinomycin injection, and erythromycin suspension are chronically undersupplied by KEMSA. Ciprofloxacin is supplied in small amounts by KEMSA, but the larger amounts supplied by the SIDA program offset this shortage.

STI kits were last supplied to Busia DH by KEMSA in July 2004, at which time 27 kits were supplied. Since then, there have been stock-outs of the above-mentioned items for about six months. Although KEMSA has announced that it would switch from a kit (push) system to a pull system, the change has yet to be made.

Treatment and Prophylaxis for Opportunistic Infections

Diagnosis and treatment of OIs are managed both at the main hospital and at the ART clinic. Prophylaxis fluconazole and co-trimoxazole are also provided at these sites and are coordinated separately from treatment of OIs.

The MSF-run ART program had 72 percent of the OI tracer commodities in stock, whereas the GOK pharmacy had 76 percent in stock. This decent stock level at the main DH pharmacy can be attributed to the support of the SIDA program. The MSF program uses additional pharmaceuticals not on the tracer list such as codeine phosphate and aciclovir. Neither program reported stock-outs of the medicines they normally stock, and neither have experienced quality issues with items supplied.

Kits used by MSF's home-based care program do not contain any controlled pharmaceuticals. Data collectors noted that at the MSF pharmacy, there was no separate dangerous pharmaceuticals cupboard for storing codeine phosphate.

Antiretroviral Treatment

An estimated 7,000 persons in Busia District require antiretrovirals (ARVs). So far, 1,000 of these are on ART. Since 2000, MSF Spain has coordinated an ART program out of the Busia DH. The program was to end in 2005 but has now been extended to 2008. The ART program is physically adjacent to the government-run VCT program. MSF has an onsite laboratory and sources its own pharmaceuticals through the MSF supply management system, which includes a central warehouse in Nairobi. The DH does not currently have a separate government-run ART program at this facility.

Currently, 1,000 patients are on ART. This program recruits approximately 60 new ART patients per month. The VCT center serves as a point of entry for the ART program. Patients who test HIV-positive at other public health facilities are referred to the ART program to determine their eligibility to start ARVs. The ART program has a good reputation that attracts patients from long distances.

The ART program is staffed by three medical officers, three clinical officers, nine nurses, one pharmacist, and four laboratory technicians. The staff includes expatriates, Kenyan non-GOK staff, and GOK staff. The pharmacist is responsible for procurement and stock-keeping, and the nurses dispense medicines.

When a client at the VCT center tests HIV-positive, he or she is booked for an appointment at the ART clinic. A file is opened for the patient, an HIV counseling session is conducted, and a medical exam and baseline lab tests are done to determine the patient's eligibility for ART. At the second visit, the patient receives lab results and has the first pre-ARV counseling session if found to be eligible for ART. Following a series of such counseling sessions and the signing of a consent form, the patient is started on ART. A treatment buddy is required as one of the eligibility criteria for the ART program. The patient is re-examined after two weeks. Once the patient has stabilized in the ART program, he or she is linked to other HIV services such as home-based care. Defaulting patients are followed up within one week; if necessary, someone is sent to the patient's home to bring the patient to the program site.

At the time of the assessment, MSF had not yet provided the DASCO with data on how many patients are seen at the ART program per day. The DASCO reported that MSF's reporting format for service statistics was difficult to follow.

Home-Based Care

MSF's home-based care program distributes kits to patients in the community. The kit contains gloves, antiseptics, a raincoat, tablets for adding to a bath, Jik bleach, painkillers (paracetamol but no narcotics), calamine lotion, and antimalarials. The kit does not contain food. MSF does provide nutritional support in the form of Lactogen 2 for malnourished children.

Commodity Management System at the Busia District Hospital Main Pharmacy[7]

Busia DH has three pharmacies: the main pharmacy, a parallel pharmacy (which complements stocks of the main pharmacy), and the pharmacy contained within the MSF-run ART program. In addition to dispensing medicines to patients, the main pharmacy also serves as a depot for health centers in the district.

Data collectors noted that, in general, the layout of the pharmacy is archaic and not conducive to the needs of a modern pharmacy. Overall, the space in this pharmacy is constrained. The office doubles as a small store. Currently, one of the hospital wards serves as the bulk store because of the insufficient storage space in the pharmacy.

The dispensing area consists of a room that has a sink with running water, good natural light, and electric lighting, although one fluorescent tube was dead. A single dispensing window is used by two pharmacy staff.

The main pharmacy has three staff members: one pharmacist and two pharmaceutical technologists. The parallel pharmacy has three staff members: a pharmaceutical technologist from the main pharmacy, one pharmacy assistant, and one clerk.

Pharmacists and pharmaceutical technologists manage stocks in the regular pharmacy. Pharmacy students also assist in the pharmacy by dispensing under the supervision of the pharmacist and pharmaceutical technologists.

Selection

Because the main pharmacy is supplied partly by SIDA, its selection of SIDA-provided items is based on the KEDL and the national standard treatment guidelines (STGs).[8]

Procurement and Distribution

The main pharmacy is supplied by both KEMSA and SIDA. Items supplied by KEMSA are supplied from the regional depot in Kakamega on a "pull" or requisition basis. Busia DH pharmacy orders what it needs from the Kakamega depot and arranges to picks up most items. When they are available, STI kits are delivered to the hospital by the depot. Other items, such as infusion sets, are "pushed" to the hospital whether they are ordered or not.

SIDA items are also supplied on a "pull" basis, and all items ordered must be on the KEDL. After quantifying its needs, the main pharmacy proposes quantities of each product to SIDA, which calculates a budget and approves or modifies the order. Orders are placed once per year, and deliveries are made quarterly. At the time of the assessment, the main pharmacy had not placed any orders to KEMSA for six months because the supply provided by SIDA fulfilled the hospital's needs and was more reliable. Products ordered by SIDA for the DH are delivered by

[7] Key informant: Stanley Nganga, Pharmacist-in-Charge.
[8] SIDA's drug procurement is based on the KEDL and the STGs.

MEDS directly to the hospital. They are stored in the bulk store as well as in the main pharmacy storeroom. No problems have been experienced with the quality of products supplied by SIDA.

Products supplied by KEMSA are more problematic. Busia DH often experiences delays with items ordered from KEMSA, and sometimes KEMSA cannot deliver the order at all. The DH often has to send a vehicle to KEMSA to collect orders, which puts a strain on the pharmacy budget. KEMSA does not normally provide information on what is available at their central warehouse to the DH, so sometimes trips to KEMSA are wasted because the DH cannot complete its order. One of KEMSA's suppliers consistently delivers substandard products to the hospital.

Busia DH also serves as a depot for public health centers in the district. This supply system is described in subsequent sections.

Storage and Record-Keeping

As mentioned before, storage space is insufficient in the pharmacy. There are no means to control ambient temperature (such as air conditioning or fans), even though the ambient temperature during the assessment was 36°C (96.8°F). There is no wall thermometer in the pharmacy.

The pharmacy does not have a system of bin cards. Instead, it relies on the S-11 government form. Currently, the system is in transition as steps are made to reconcile the S-11 forms with bin cards. The pharmacy also has a cash register book.

A number of Ministry of Health (MOH) registers are used to collect data on commodity consumption. Registers exist for STIs, HIV testing and blood safety, and PMTCT. They include:

- STD Tabs/Caps, Injection Register MOH 360
- HIV Care Clinic Patient Register MOH 361
- STD Monthly Summary Sheet
- HIV Care Clinic Monthly Summary Sheet
- Integrated M & E Report Form MOH 727
- VCT Lab Register MOH 362
- HIV Testing Kits/Blood Safety Monthly Summary Sheet

Prescribing and Dispensing

Busia District Hospital once had a hospital Pharmacy and Therapeutics Committee, but it was discontinued due to lack of focus. The pharmacist in charge of the regular pharmacy attempted to revive it but so far has been unsuccessful.

For the moment, an adequate number of prescription forms are stocked in the pharmacy, but supply is usually erratic. When providers run out of prescription forms, they "improvise" using scraps of paper. Prescription forms are purchased by the Busia DH records department from the Government Printer in Nairobi every six months. The pharmacy staff report that over-prescribing of certain medicines, especially antibiotics, is very common. Inadequate information on

prescriptions is also a common problem. A review of 30 randomly selected prescriptions found that the most commonly missing information on prescriptions were age, sex, and weight of patients; generic name for pharmaceuticals; and route of administration of medicines.

Dispensing is done by pharmacy students under the supervision of the pharmacist in charge and pharmaceutical technologists. Pharmaceuticals are dispensed through a single window at the pharmacy. Dispensing is done by hand, as dispensing triangles are not available. Observation of dispensing encounters found that information on side effects, drug-drug interactions, and taking of medication in relation to meals was seldom given to patients during medication counseling. Dispensing encounters are short: The longest of 10 encounters observed lasted three minutes and the shortest lasted one minute.

Commodity Management System in the Médecins Sans Frontières ART Program[9] *at Busia District Hospital*

Selection and Procurement

MSF's ART program uses regimens that are identical to the GOK's first-line and second-line regimens. ARVs stocked include fixed-dose combinations such as Triomune (Cipla), Triviro (Ranbaxy), and Coviro (Ranbaxy).

Very few patients are on second-line combinations; of those who are, the majority are patients who were previously on ARVs and transferred from another program or were paying for treatment out of their own funds.

MSF's ART program uses its own supply chain for all pharmaceuticals except fluconazole, which is obtained through a donation program. The pharmacy for the ART program orders from its Nairobi warehouse on a weekly basis.

Storage and Record-Keeping

Pharmaceuticals are stored in the ART pharmacy. The pharmacy maintains bin cards, which are updated daily.

Prescribing and Dispensing

MSF's ART program does not use prescriptions; rather, it uses a patient treatment card that indicates the regimens used in addition to other clinical information. Dispensing time observed by data collectors was approximately five minutes, but minimal medication counseling is done in the pharmacy. Counseling on medicine usage and side effects is apparently conducted by adherence counselors. Patients are given up to a three-month supply of medicines at one time after having sufficiently demonstrated adherence. Pill counts are done for both ARVs and OI medicines.

[9] Key informant: Maureen, a nurse.

Reference Materials

Although copies of the Kenya STGs are available at Busia DH, the *Guidelines to Antiretroviral Drug Therapy in Kenya,*[10] *Guidelines for Prevention and Management of Opportunistic Infections and Tumours in HIV/AIDS,*[11] and *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya*[12] were not seen in the GOK pharmacy. Common pharmaceutical references such as the *British National Formulary* (2003 version) were present, but no copies of the *Monthly Index of Medical Specialties* (*MIMS*) were available in the GOK pharmacy. The pharmacy had a very old edition of *Martindale: The Extra Pharmacopoeia.*[13]

Matayos Health Center[14]

Located 15 kilometers from Busia town, Matayos Health Center (HC) is a 16-bed health facility that is 200 meters off the main road leading to the Kenya-Uganda border post in Busia.

The Matayos HC staff includes one clinical officer in charge, one registered nurse, five enrolled nurses, one lab technologist, one lab technician, one public health officer, five public health technicians, six community health workers, six casual sweepers, and two government sweepers. Additionally, the facility has two staff from the Japan International Cooperation Agency (JICA) who work in collaboration with the Kenya Medical Research Institute (KEMRI) in the follow-up of pregnant mothers. The pharmacy is staffed by a nurse who is assisted by one JICA staff member. Matayos HC operates 24 hours per day, seven days per week.

This facility has 24-hour access to electricity but has periodic power outages, most frequently during the rainy season in April–May. The facility has no generator. Matayos HC has two sources of water: one supplied through the main piped water system and another through a borehole (well) with electric pump (bought by AMKENI). Currently, only borehole is in use. The facility does not have a fixed telephone line. Instead, it has a dedicated mobile telephone, which was bought with cost-sharing money.

The majority of patients seen at Matayos HC are farmers and hawkers. The key informant felt that Bumala "A" and Sega were areas where truck drivers are more likely to go for health services. The average monthly wage in the area is estimated to be KES 1,000–4,000 per month. The top diseases seen at this HC are malaria, diarrheal diseases in children, and chest infections. Malnutrition and STIs are also seen, albeit less often.

Services at Matayos Health Center are subsidized. Patients pay a KES 20 registration fee, which covers the consultation, medicines, and lab tests. ANC, family planning services, and services for children under five are not subject to this fee. Clients requiring more complex testing are referred

[10] Ministry of Health (MOH). 2002. *Guidelines to Antiretroviral Drug Therapy in Kenya*. Nairobi, Kenya: MOH.
[11] National AIDS/STDs Control Programme. 2002. *Guidelines for Prevention and Management of Opportunistic Infections and Tumours in HIV/AIDS.* Nairobi, Kenya: Ministry of Health.
[12] Government of Kenya. 1994. *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya.* Nairobi, Kenya: Ministry of Health.
[13] Martindale, W. *Martindale: The Extra Pharmacopoeia*. London: Pharmaceutical Press.
[14] Key informant: Mr. Aburili Masengo, Clinical Officer in Charge of the Matayos Health Center. Mr. Masengo has been in charge of this facility since 2001.

to Busia District Hospital, where they pay additional fees for services rendered and medicines provided.

HIV/AIDS-Related Services

Matayos HC is one of nine public health facilities in Busia District with a Preventive Care Clinic. HIV-related services provided at Matayos HC include:

- VCT
- PMTCT
- STI treatment
- OI prophylaxis and treatment
- Condom distribution
- IEC (videos in the patient waiting area)

VCT

VCT has been provided since February 2004. The facility has one VCT room, which can accommodate a maximum of eight patients per day. It is estimated that around 50 VCT clients are seen per week at this facility. VCT is done by six trained counselors, including four nurses, one laboratory technician, and one community health worker. In 2004, 651 patients were tested through VCT, and 94 were found to be HIV-positive (14.4 percent). In addition to the VCT services at the HC, there is also a mobile VCT service.

Commodities used in VCT include:

- Uni-Gold HIV 1/2 test kits (400 were left at the time of the assessment)
- Determine HIV-1/2 test kits (out of stock at the time of the assessment)
- Gloves
- Condoms
- Lancets
- Chase buffer

The HC had 400 Uni-Gold test kits remaining at the time of the assessment, and Determine test kits had been out of stock for one month. Stock-outs of Determine test kits began because of the introduction of the mobile VCT program and the PMTCT program. Uptake in the mobile VCT program has been particularly high, using up to 50 kits per day. Quantification for test kits prior to the start of the program did not anticipate such a high uptake, and will therefore have to be revised. The facility has experienced stock-outs of chase buffer in the past, although the current stock is sufficient. No problems have been experienced with the quality of items used in VCT services.

HIV test kits are supplied by JSI and KEMSA. MSF supplies supplementary test kits, and KEMSA supplies chase buffer. KEMSA also supplies male and female condoms. The German Technical Cooperation Agency provides male condoms.

Condom Distribution

On average, 2,000 condoms are distributed per week.

PMTCT

The PMTCT program at Matayos HC started in September 2004. The clinical officer in charge and two nurses have been trained in PMTCT. From September to December 2004, 181 PMTCT patients were tested for HIV and 18 of those were positive (10 percent prevalence). Commodities used in PMTCT include HIV test kits, nevirapine tablets, and nevirapine syrup. Nevirapine is supplied by MSF and KEMSA. Currently, there is competition for test kits between the VCT and PMTCT services, which will need to be remedied by proper quantification.

Treatment and Prophylaxis for Opportunistic Infections

The Preventive Care Clinic operates every Friday and provides people living with HIV/AIDS (PLHA) with services and medicines. A separate stock of medicines (separate from the main HC pharmacy), mainly consisting of items used for treating OIs and STIs, is kept for this clinic. Between the two "pharmacies," the facility was found to have 68.9 percent of the items on the OI tracer list available at the time of the assessment. Other items used in addition to those on the tracer list included aciclovir for herpes treatment.

OI medicines stocked in the main pharmacy are supplied by SIDA using MEDS. Stock-outs have been experienced for clotrimazole pessaries, erythromycin tablets, and paracetamol. The average time out of stock of these products is 14 days. Demand for clotrimazole pessaries is particularly high.

Diagnosis and Treatment of STIs

STI service data from 10 months of 2004 were available for Matayos HC. Based on a total of 1,079 cases for this period, there were an average of 108 STI cases per month or 27 cases per week. Many STI patients at Matayos come from Bumala "A" and Sega, two hot spots for CSWs and truck drivers.

STI services include diagnosis (particularly rapid plasma reagent [RPR] testing) and treatment. Six Matayos HC staff have received some form of training in STI diagnosis and treatment; the training was obtained from Nairobi University (1993), AMKENI (2002), and the District Health Management Team (DHMT) (2002).

Commodities used at Matayos HC for STI services include a number of medicines (primarily doxycycline, metronidazole, benzathine penicillin, norfloxacin, spectinomycin, ceftriaxone, and erythromycin syrup), as well as RPR kits for diagnosing syphilis.

At the time of the assessment, Matayos HC had 61 percent of the medicines on the STI tracer list available. The facility had had a prolonged stock-out of GOK-supplied STI medicines, namely erythromycin, spectinomycin, ceftriaxone, and clotrimazole pessaries, which had been out of stock for 14–21 days. This stock-out was mitigated by the supply of STI medicines funded by

SIDA. The clinical officer in charge was concerned that in the near future, there would be stock-outs of RPR kits.

RPR kits are supplied by MSF and KEMSA. RPR kits can also be purchased from Kisumu Chemists, but they are too expensive for the HC to buy, so clients have to be referred to Busia DH for diagnosis. The clients incur extra costs when they are referred, as they have to pay for transportation to Busia DH.

STI medicines are supplied by KEMSA and SIDA. They are supplied in kits, which has created problems. Kits contain fixed quantities of medicines that cannot be adjusted according to actual consumption patterns of the recipients. As a result, some fast-moving items are undersupplied, leading to stock-outs, and slow-moving items are oversupplied. As a solution, KEMSA has been supplying "double kits" to help prevent stock-outs. However, stock-outs persist for some items.

At the time of the survey, no quality problems had been experienced to date with items supplied by SIDA, which are purchased through MEDS. However, quality problems have been experienced with some items supplied by KEMSA, such as paracetamol that was discolored.

Services for PLHA

As mentioned above, a Preventive Care Clinic runs once a week on Fridays for PLHA. It is estimated that five to eight PLHA are seen per day on clinic days. Antiretrovirals are not yet provided as part of this service, although there are plans to provide them in the future. Clients diagnosed as being in Stage 3 or 4 of HIV infection are referred to Busia DH to be evaluated for eligibility for the ART program run by MSF. Matayos HC attempted to provide nutritional support to patients, but this effort was unsuccessful. No home-based care is offered, nor are there services for orphans and vulnerable children.

Information, Education, and Communication

A nurse at Matayos HC coordinates all preventive care activities related to HIV/AIDS, assisted by animators trained by the AMKENI project and 50–60 volunteer community health workers. Educational videos are shown in the waiting area of the HC during the day, which is believed to be a big "selling point" for the health center.

Commodity Management System

The nurse (assisted by JICA staff) is responsible for overall management of stock. Ordering is done by the nurse, but bin card control and reviews of monthly reports are done by the clinical officer in charge.

Selection and Procurement

Selection of medicines and other items is based on local epidemiology and disease-specific national guidelines (e.g., for OI treatment). The facility did not have a copy of the Kenya National STGs, so a copy was provided at the end of the assessment. It is notable that both SIDA and MSF select their items based directly on the Kenya Essential Drugs List.

The procurement process starts with the pharmacy nurse making a request for commodities to the clinical officer in charge. This normally happens on a weekly basis. The clinical officer then calculates the cost of the requirement and presents this to the Health Center Committee for consideration. Once the committee approves the order, the clinical officer, committee chairman, and treasurer withdraw the requisite amount of cash from the health center's community account[15] at a local bank, and the clinical officer buys the supplies from vendors using cash.

If the clinical officer is ordering supplies from Busia DH, the approved order is placed without using cash. The district store then either has the goods delivered to the HC, or HC staff go to the district store at Busia DH to pick up the items. KEMSA and SIDA make their deliveries to the district store rather than to the health center. Getting transportation to pick up supplies from Busia DH is often difficult, which in turn delays medicines and other supplies becoming available to clients. Busia DH also often has delays in making items available.

Storage and Record-Keeping

The clinical officer in charge segregates short-expiry pharmaceuticals within the bulk store to ensure that these are used first. The bulk store is located very near the pharmacy and is quite small. The pharmacy does not have air conditioning. A refrigerator in the minor surgery theater is used to keep test kits and ice packs.

The management information system consists of the pharmacy and revenue registers and a set of bin cards contained within a book. Records are kept consistently. The clinical officer in charge personally checks the stocks against paper records on a monthly basis.

Rational Use

Like many health facilities in this assessment, this health center does not normally use prescriptions; rather, the client brings to each appointment a patient book or card, where prescriptions are written alongside the diagnosis and treatment course. The clinical officer writes the prescription into the patient book, which is taken to the pharmacy, where the medicine is dispensed. Whatever is dispensed is entered into the pharmacy register. Prescription information in the patient book includes the name, age, and sex of the patient, as well as the date of the prescription.

When the facility had prescription forms, it used them until they ran out. Although the forms were finally replenished, the decision had been made not to use prescription forms anymore because writing prescriptions was viewed as time-consuming. Only three prescriptions were available for review. The most commonly missing information on these was patient sex and weight and prescriber name. Writing was illegible on all prescriptions, and none contained serial numbers.

[15]When the health center had a cost-sharing program, it had a special account for funds generated from this program. The account was controlled by the district accountants. During cost-sharing, the facility could collect up to KES 50,000 in a month. When cost-sharing ended, the only money collected directly from patients was the KES 20 registration fee. The registration fees generate about KES 15,000 per month, which goes to a community account for health facilities.

Dispensing is done by an enrolled community nurse with no special training in dispensing. Medicines are dispensed into brown paper envelopes. Observation of 10 dispensing encounters revealed that medication counseling seldom included information on side effects and drug-drug interactions. Although dispensing labels were used, they only included the patient's name and the medicine's name and frequency of administration. Dispensing encounters were short, lasting an average of one minute. Dispensing was done by hand, as dispensing triangles were not available.

Reference Materials

No reference materials were available in the pharmacy at the time of the assessment. However, the *Guidelines to Antiretroviral Drug Therapy in Kenya*, the *Guidelines for Prevention and Management of Opportunistic Infections and Tumours in HIV/AIDS*, and the national PMTCT guidelines were available in the office of the clinical officer. The *British National Formulary*, the *Monthly Index of Medical Specialties*, and the *Drugs & Chemists Price List*[16] were not available in the facility at all. One copy of the 2002 edition of the *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya* is now available in the office of the clinical officer.

Tanaka Nursing Home[17]

Tanaka Nursing Home, an 80-bed (which includes 15 maternity beds) private hospital, is located 300 kilometers off the main road leading to the Kenya-Uganda border at Busia Town. Tanaka Nursing Home operates 24 hours per day, 7 days per week. The key informant felt that Tanaka Nursing Home was frequented primarily by well-to-do residents of Busia District who have no problems paying for commodities such as medicines. He felt that this group was more likely to seek medical care at private facilities. However, he expressed that it is difficult for health providers to accurately classify patients; for example, truck drivers may identify themselves at the nursing home as "businesspeople" rather than as truck drivers.

The facility has basic infrastructure, including water and electricity. At times, blackouts are experienced at night. The facility does not experience problems with running water.

The Tanaka Nursing Home staff includes one medical officer, three clinical officers, eight qualified nurses and one locum, one lab technologist, one lab technician, and four or five cleaners. There are also administrative staff, three watchmen, and one driver. Pharmacy employees include two registered nurses and one nurse's aide. The facility has no pharmacist or pharmaceutical technologist.

HIV/AIDS-Related Services

HIV-related services provided include HIV testing, STI treatment, and OI treatment. Antiretroviral treatment had just been added to the package of services at the time of the assessment.

[16] A periodical published by Scientific Media Services Ltd.
[17] Key informant: Mr. Cheruyiot, Clinical Officer.

VCT

Although this facility occasionally has inpatients who are HIV-positive, it does not have a VCT program. Plans are in place to set up VCT services in the future, however. HIV/AIDS testing is carried out by the laboratory. The facility's laboratory reports that 5 to 10 HIV tests are done per month using rapid test kits. Kits used and available in the laboratory at the time of the assessment included Uni-Gold, Capillus, and Determine. Although this facility distributes condoms, it does not keep track of the number distributed.

Tanaka Nursing Home has a contract with a transportation company (Transami) to provide medical treatment to truck drivers. There is no formal structure, however, for HIV testing and treatment, and to date, few truck drivers have taken advantage of this scheme. Tanaka treats only one or two clients per week through this scheme, even though they have a list of 50–100 employees who are eligible for services at this facility. Truck drivers are eligible for services of up to a value of KES 400,000 per year for inpatient services and the same amount for outpatient services.

Antiretroviral Treatment[18]

At the time of the assessment, this facility had begun training staff in ART in order to begin providing antiretrovirals within the next few months. The training is being coordinated by Sr. Perris Wandera, a retired District Public Health Nurse. Eventually, all clinical and pharmacy staff will be trained, with different groups being trained three times a week over a two-week period.

For the moment, patients who test HIV-positive are referred to the MSF program for CD4 testing, as this facility does not have CD4 testing capacity.

Tanaka Nursing Home has already purchased generic ARVs in preparation for the launch of its ART program. ARVs have been purchased from Harley's in Kisumu.

Commodity Management System

The process of procuring commodities for this facility involves the following steps. Every month, the pharmacy staff makes a list of its requirements based on historical consumption, local epidemiology, seasonality of health problems, and orders already made. This list is provided to the medical officer in charge of the facility. The medical officer examines the order and modifies it based on budgetary constraints and judgment of actual commodity needs. Pharmacy staff expressed that omissions from and substitutions to orders are often made without consulting the pharmacy, resulting in shortages and even stock-outs and necessitating emergency purchases from local suppliers.

Tanaka Nursing Home is 116 kilometers from a major supplier of commodities in Kisumu and 600 kilometers from the supplier in Nairobi. Main suppliers for non-emergency orders include

[18] Interview with Ms. Terry Olunga, a nurse's aide, and Ms. Jordensia Kidelenge.

Harley's in Kisumu for medicines and Asterisk for non-pharmaceutical items. The lead time for filling orders placed is two days for medicines, as these are usually delivered by Securicor. Recently, Tanaka has experienced shortages of cotton wool from Asterisk and has resorted to purchasing it from local suppliers. Tanaka reports not experiencing problems with the availability and quality of goods delivered by suppliers.

Medicines in the pharmacy are regularly checked to track expiry dates, and medicines approaching expiry are isolated to ensure earlier use. Tanaka Nursing Home liaises with the District Health Authorities to dispose of expired medicines.

Tanaka Nursing Home had in stock 82.7 percent of the items on the OI tracer list of medicines, 83.3 percent of tracer medicines to treat STIs, and 35.2 percent of tracer items for ART. This facility had all five of the tracer items for VCT services.

Reference Materials

Although this facility had copies of the *Guidelines to Antiretroviral Drug Therapy in Kenya*, the national PMTCT guidelines, and an African version of *MIMS* at the time of the assessment, these publications were not seen in the pharmacy. Facility staff were not aware that the *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya* existed.

Bumala "A" Health Center[19]

Bumala "A" Health Center is a public health center located two kilometers from the main road leading to the Kenya-Uganda road in Busia town. Located within Busia District, this health center borders Siaya District in Nyanza Province.

In this community, people access health services at the health center and at private clinics. Many clients attending Bumala "A" Health Center are poor and have difficulty paying the KES 20 registration fee that covers all services provided at the center. Bumala "A" Health Center clients come mainly from nearby Sega and neighboring Siaya District. About 1.5 kilometers from the health center is a slum area with many informal businesses such as hotels and bars where commercial sex workers and truck drivers converge. Drivers are known to prefer to park at Sega and to frequent the "K-2" hotel/restaurant. Health workers reported that many CSWs and truck drivers come for treatment at Bumala "A" Health Center, and that syphilis is common among this population.

Bumala "A" Health Center operates from 8:00 AM to 5:00 PM. It is not open at night because it functions as a dispensary and therefore has no wards. Health center staff include one registered nurse, three enrolled community nurses, one lab technologist (paid from community funds), and six subordinate staff from the community (also paid from community funds).

Resources and infrastructure are minimal at this facility. The facility is only a few years old, so the physical plant is in good repair. However, Bumala "A" has no electricity or running water; at the time of the assessment, the toilets were not functioning due to lack of water. A mini-

[19]Key informants: Senior Nursing Officer (SNO) Kevin Okunga, SNO Faustin Apeli.

generator stored in the pharmacy is used for electricity. Rainwater is tapped into a large, cement underground tank, and the water is manually pumped and then boiled for patient use. This facility has no fixed telephone line or dedicated mobile phone. Both Safaricom and Celtel mobile telephone networks are accessible in this area.

HIV/AIDS-Related Services

HIV/AIDS-related services provided at Bumala "A" Health Center include:

- Condom distribution
- STI diagnosis and treatment
- OI treatment
- Health services for PLHA

This facility has no VCT services, but plans are under way to open a VCT center within the next year. Staff have not yet been trained in VCT, although two staff are already trained in PMTCT.

Condom Distribution

Bumala "A" Health Center distributes around 25 boxes of condoms per week.[20] In addition to a condom dispenser at the health center, a public health officer distributes condoms in the market area commonly frequented by truck drivers and CSWs.

Diagnosis and Treatment of STIs

This facility sees an average of 10 STI cases per week.[21] Tests used in STI diagnosis at Bumala "A" Health Center include the Venereal Disease Research Laboratory (VDRL) test and urinalysis. At the time of the assessment, the facility had an outdated GOK-published MOH/NASCOP STI syndromic management chart. The staff of this health center have not received training in STI diagnosis and treatment. SIDA assists with the purchase of commodities to treat STIs.

Treatment and Prophylaxis for Opportunistic Infections

The facility sees a number of patients with opportunistic infections and provides some of the medicines required to treat these. The facility also does sputum tests for tuberculosis (TB), for which it buys the reagents, and manages patients with TB.

Health Services for PLHA

The facility regularly treats persons suspected of being HIV-positive, although it is unable to quantify how many per week. Commodities related to these services include latex gloves and

[20] One box contains 100 condoms.

[21] This average is based on data for three months in 2004. There were 44 STI cases in August, 28 in July, and 46 in September. This gives an average of 10 cases per week.

condoms. HIV test kits used in the GOK program were not yet available at this facility at the time of the assessment.

Commodity Management System

At Bumala "A" Health Center, medicines and other health commodities are managed by enrolled community nurses. The facility has a pharmacy where dispensing is also done, as well as an adjoining storeroom.

This health center lacks many pharmaceuticals, so patients are often given a prescription written by the nurse in charge of the facility and sent to buy the items from chemists. Prescriptions are written only for persons requiring items from local chemists; patient books are used for patients obtaining medicines from the health center pharmacy.

Busia DH supplies Bumala "A" Health Center on a monthly basis with GOK-funded and SIDA-funded commodities on a "pull" basis. Busia DH does not issue entire kits to Bumala "A" Health Center; the pharmacist at the DH opens the kits and issues only items that are needed. Occasionally, Bumala "A" HC staff visit Busia DH to see what GOK- and SIDA-funded items are in stock. The HC places emergency orders as needed. The lead time for receiving medicines is around 30 days.

SIDA assists Bumala "A" directly with obtaining some of its medicines for STI treatment. However, Bumala "A" sometimes experiences delays in delivery from SIDA. Bumala "A" has experienced stock-outs of amoxicilline, for example. Bumala "A" had just 50 percent of the STI tracer list items in stock at the time of the assessment.

Bumala "A" Health Center has experienced stock-outs of a number of items used to treat opportunistic infections, such as procaine penicillin, hydrocortisone, loperamide, nystatin, paracetamol tablets, and paracetamol syrup. However, when the medicines are available, no quality problems are experienced with them. Bumala "A" had just 44.8 percent of the OI tracer list items in stock at the time of the assessment.

Although Bumala "A" Health Center is expected to start VCT services soon, it did not have rapid HIV test kits in stock at the time of the assessment.

The facility uses the "STD Tabs/Caps, Injection Register MOH 360" form to track the use of tablets, capsules, and injections.

Reference Materials

Bumala "A" Health Center had no reference materials to assist with management of health commodities. Health center staff did not have copies of Government of Kenya guidelines for VCT or PMTCT, nor did they have the *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya.* They did not have any pharmaceutical references such as the *British National Formulary* or the *Monthly Index of Medical Specialties*. The only guidelines available were the national malaria guidelines.

Scorpion Pharmacy[22]

A popular pharmacy in Busia town located about 100 meters off the highway, Scorpion Pharmacy is the major pharmaceutical wholesaler in Busia District and also supplies neighboring districts.

Staffed by one pharmacist and two pharmaceutical technologists, this pharmacy is open from 8:00 AM to 7:00 PM. Scorpion Pharmacy is supplied primarily by Harley's in Kisumu and by pharmaceutical companies based in Nairobi. The pharmacy has a pickup truck that travels around Kisumu to collect pharmaceutical supplies.

The key informant said truck drivers and commercial sex workers were among Scorpion's major clientele, along with hawkers, boda boda drivers, and other residents of and visitors to Busia town. Many clients are low-income and semi-literate. Low incomes result in clients' inability to afford the best medicine for their given health problems, and they are forced to resort to cheaper alternatives and/or sub-optimal doses.

The key informant identified a variety of behaviors common among the pharmacy's clientele. Truck drivers often know the names of medicines and ask for them specifically, with or without a prescription. Truck drivers tend to ask for brand-name medicines, and their top requests include benzathine penicillin 2.4 mega, amoxicilline capsules, erythromycin tablets, norfloxacin tablets, doxycycline capsules, spectinomycin injection, Viagra tablets, Postinor II, clotrimazole (Candid-B gel and cream, and Clozole Plus gel), and condoms. Certain clients visit the pharmacy daily to buy products that claim to boost sexual vitality such as Enzoy and M.W. Tonic. Some clients are so well-informed about certain items that the key informant felt they were more conversant in the treatment options (for TB, for example) than the pharmacy staff.

The key informant reported that Kenyan CSWs are said to be "shy" and to "beat around the bush" when buying medicines for STI treatment, whereas Ugandan CSWs are more likely to disclose their health problems and occupation to pharmacy staff without embarrassment.

Clients come to this pharmacy from Uganda for a number of reasons. Some medicines available at this pharmacy are not available in Uganda because they are not registered there or because Ugandan pharmaceutical regulations do not allow for the stocking of certain items such as gentamicin injectables. Additionally, Ugandan clients can preserve anonymity by crossing the border to buy medicines. Ugandan CSWs often request medicines such as ceftriaxone and gentamicin.

Scorpion Pharmacy handles at least 20 STI cases per day, and usually sees an increase in STI cases in December. This is thought to be because young people are on school holidays at that time, so sexual activity among school-age persons therefore increases. The key informant has special training in STI management from Busia District Hospital. This training is believed to give the pharmacy a competitive edge over pharmacies that do not have an STI-trained person onsite.

[22] Key informant: Mr. Richard Mokaya Ombogo, Pharmaceutical Technologist, Scorpion Pharmacy.

This pharmacy had 82.7 percent of the items on the OI tracer list available and 100 percent of the items on the STI tracer list available at the time of the assessment. The pharmacy was not selling ARVs at the time of the assessment, and the only VCT-related items it stocked were latex gloves and condoms.

Reference Materials

This pharmacy had some basic pharmaceutical references available. These were the *British National Formulary, MIMS,* and *Martindale*. However, the pharmacy did not have copies of the *Guidelines to Antiretroviral Drug Therapy in Kenya,* the *Guidelines for Prevention and Management of Opportunistic Infections and Tumours in HIV/AIDS,* or the latest version of the *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya*. The key informant felt that the pharmacy could benefit from having technical and educational pharmaceutical materials for patients on ART.

Figure 1 reflects availability of STI and OI medicines in all the facilities assessed in Busia District.

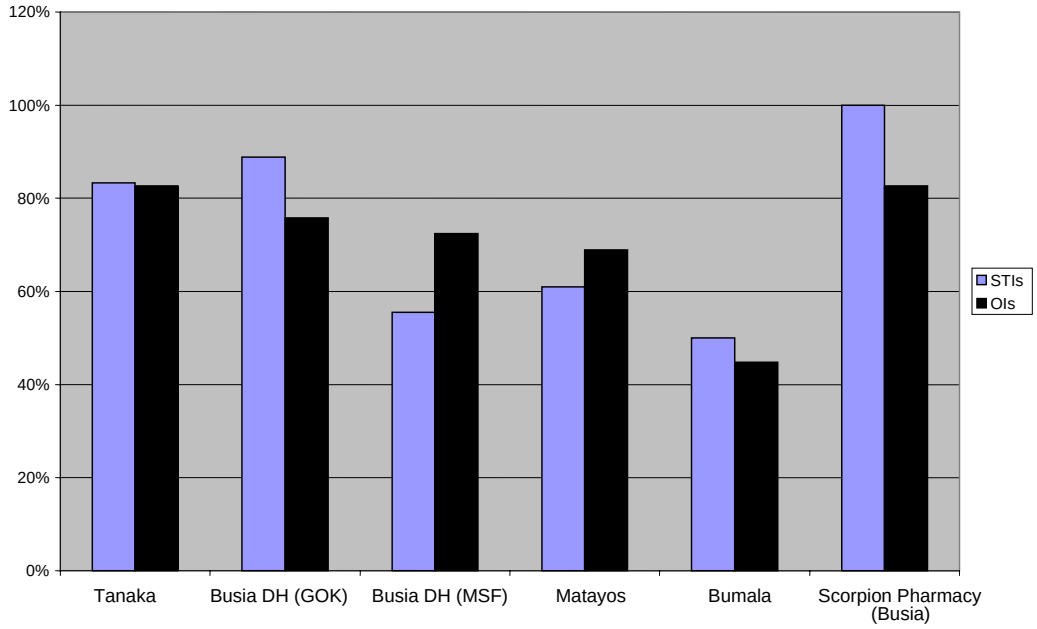

Figure 1. Availability of Medicines for Treating STIs and OIs in Busia District Facilities

ASSESSMENT FINDINGS: TESO DISTRICT

Community Characteristics

The town of Malaba is located in Teso District on the border between Kenya and Uganda, adjacent to Busia District. Because the administrative seat of Malaba is in another town known as Amagoro and because the public health facility nearest to Malaba is Teso District Hospital in Kocholyia town, the decision was made to assess health facilities in these two other towns as well.

Malaba has virtually no bona fide health facilities to serve its population of approximately 20,000. Residents of Malaba and Teso District tend to seek health care at Teso District Hospital in Kocholyia, Amagoro Medical Clinic (a private clinic), and pharmacies and clinics along the highway. Malaba has only one stand-alone laboratory. Community residents tend to buy medicines at Amagoro Clinic or at private chemists. There are six pharmacies in Teso District: two in Kocholyia, two in Amagoro, and two in Malaba. According to district health officials, most of these pharmacies are not operated by qualified personnel.

Several organizations currently provide services related to HIV/AIDS in the Malaba-Amagoro-Teso District area. These include:

- World Vision: Provides nutrition support (milk) but has no capacity to follow up with clients

- Academic Model for the Prevention and Treatment for HIV/AIDS (AMPATH): Runs the ART program on the premises of Teso District Hospital, provides OI prophylaxis and treatment, and provides nutritional support for infants

- FHI: Conducts outreach through mobile VCT services

- Population Services International: Promotes the use of and distributes insecticide-treated bednets (Supanet brand) for pregnant women and children under five

The populations of Malaba, Amagoro, and Kocholyia are quite poor. Residents are mainly farmers and peasants (Kocholyia and Amagoro), civil servants (Amagoro), petty traders (Malaba), and commercial sex workers. The average income of residents ranges from KES 500 per month in Teso District to up to KES 3,000 per month in Malaba and Amagoro. Diseases commonly found in these areas are malaria, diarrheal disease, and respiratory infections.

Only the Celtel mobile telephone network is accessible in this area.

Temperatures can be quite high in this part of the country. At the time of assessment, the average temperature was 38°C (100.4°F).

Facility Characteristics[23]

Teso District Hospital [24]

Teso District Hospital in Kocholyia is a 24-bed hospital located in Teso District, about 15 kilometers from Malaba and one kilometer off the highway. This facility was included in the assessment because it is the closest public health facility to Malaba.

Most patients attending Teso District Hospital are farmers. Although Teso District Hospital is located along the Northern Transport Corridor, data collectors were informed that not many identifiable truck drivers or commercial sex workers seek services at the hospital.

Malaria, respiratory infections, and diarrheal diseases are the most common illnesses treated at the hospital. Clients tend to be poor, with an average income of KES 500 per month. Patients pay a KES 20 registration fee for consultations and additional charges for medicines, x-rays, and laboratory tests.

The hospital is open 24 hours per day, 7 days per week. The facility reported having no problems with electricity, and it does not have a generator. Water is supplied to the hospital through a borehole. At times, hospital taps run dry when the well dries out.

The hospital staff consists of 1 medical officer, 5 clinical officers, 29 nurses, 2 health records officers, 1 pharmaceutical technologist, 1 physiotherapist, 4 lab technicians, 1 occupational therapist, 1 nutritionist, and 1 dental technologist.

HIV/AIDS-Related Services

HIV services offered include:

- VCT
- STI
- OI
- ART (through the AMPATH program)

The DASCO, in collaboration with the District Health Education Officer, is in charge of IEC for STIs and HIV/AIDS in the community. The ART clinic is open only on Fridays. The hospital provides VCT and STI services, as well as OI diagnosis and treatment. Clients who test positive at the VCT center are referred to the ART program run by AMPATH.

[23] The data collection team for Malaba included Ms. Christine Onyango, MSH/RPM Plus, and Dr. Brian Maiyo, consultant to MSH/RPM Plus.
[24] Key informant: Mr. Joseph Moyale, District HIV/AIDS and STI Control Officer.

VCT

Teso District Hospital has provided VCT services since 2002. In 2004, the VCT center tested 376 patients, of whom 41 were HIV-positive (10.9 percent). The VCT center is open Monday through Friday from 8:00 PM to 5:00 PM. The VCT center is not open on weekends.

Commodities normally used in the VCT center include Determine and Uni-Gold test kits, lancets, chase buffer, latex gloves, and condoms. Three of five items on the VCT tracer list were available at the time of the assessment. Determine test kits had been out of stock for three months. In December 2004, there had been a nationwide stock-out of Determine test kits, which are normally supplied by KEMSA. When test kits are available, no quality problems have been experienced with them.

Diagnosis and Treatment of STIs

Diagnosis and treatment of STIs are available at Teso DH. The most common STIs seen are pelvic inflammatory disease for women and urethral discharge for men. Diagnostic tests done include the VDRL test and urinalysis, among others. At the time of the assessment, this facility had 77.7 percent of items on the STI tracer list. The pharmacy reports not having experienced stock-outs of the STI medicines it normally keeps in stock. KEMSA is the supplier for STI test kits and medicines.

STI medicines are also provided by the ART program run by AMPATH. The AMPATH program had 55.5 percent of items on the STI tracer list in stock at the time of assessment. This low percentage can be explained by the fact that AMPATH does not have an onsite pharmacy at the STI clinic. The doctor who runs the clinic once per week usually carries an array of commodities with him, which he takes with him when he leaves. The last training in STI management received by Teso DH staff was in syndromic management of STIs in 2002.

Treatment and Prophylaxis for Opportunistic Infections

Teso DH supplements the OI treatment provided through the AMPATH ART program. The hospital does not have a particular clinic where OI patients are seen. At the time of the assessment, this facility had 72.7 percent of the items on the OI tracer list.

The pharmaceutical technologist in charge of the pharmacy expressed that the Teso DH had experienced major stock-outs of OI items over the past two to three years. Calamine lotion had been out of stock for two years, fluconazole had been out of stock for three years, and ketoconazole had been out of stock for three years. These products had been stocked at the pharmacy in the past, and it is thought that, with the exception of fluconazole (which is available free of charge through a donation program), the hospital may have stopped buying them due to lack of money. It is not clear why free pharmaceuticals like fluconazole are not currently being stocked and dispensed by the hospital. KEMSA is the supplier for OI medicines.

The AMPATH program had 41.3 percent of tracer OI medicines on hand at the time of the assessment. As explained above, the AMPATH program does not currently keep many medicines on the clinic premises; many are brought by the visiting ART doctor once per week.

Commodity Management System[25]

Selection of commodities is based on historical consumption determined through examination of pharmacy records. The Teso DH pharmacy does not have a copy of the *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya* or the Kenya Essential Drugs List, which would allow it to base selection on national guidelines. The procurement process starts with the pharmaceutical technologist ordering medicines from KEMSA's Kakamega depot. Upon receiving the order, the depot in turn orders directly from KEMSA/Nairobi by fax. When goods arrive at the Kakamega depot, Teso DH's pharmaceutical technologist travels there to collect them.

Upon arrival at the Kakamega depot, the pharmaceutical technologist may supplement the order depending on what other items are in stock at the depot. He then checks the consignment for accuracy before returning to Teso DH with the items. The items are processed through the main hospital store by the storeman before being released to the pharmacy. The distance from Teso to the Kakamega depot is 120 kilometers, and the lead time for obtaining commodities is 90–120 days.

Problems experienced with commodities delivered by KEMSA include:

- Poor quality, such as Fansidar tablets crumbling into powder and discolored paracetamol. Products supplied by one particular supplier are consistently substandard.
- Oversupplies of little-used products such as chlorpromazine tablets and aminophylline injection
- Undersupplies of essential medicines such as antimalarials (e.g., quinine) and pediatric formulations (e.g., antibiotic syrups)

Storage and Record-Keeping

Storage space for health commodities at the Teso DH pharmacy is highly inadequate. The pharmacy is extremely small, and the space is equivalent to that of a corridor. Dispensing space is also inadequate, and the dispensing window is improperly placed. The pharmacy would require expansion and redesign in order to function optimally. There are no means to control temperatures in the pharmacy, nor is there a refrigerator for storing items requiring refrigeration, such as insulin. These products are currently kept in a refrigerator in the laboratory, which is located about 200 meters away, next to the VCT center. At present, the space in the pharmacy would not accommodate a refrigerator if one were available.

[25] Key informant: Mr. Tokomo, Pharmaceutical Technologist.

Records are maintained by the storeman and the pharmaceutical technologist. The record-keeping system includes registers (for antibiotics but not for other pharmaceuticals), bin cards (for injectables only), and S11 and S12 government forms (for other pharmaceuticals).

Prescribing and Dispensing

The only formal prescriptions found at this facility were duplicate prescriptions for antibiotics. This facility does not routinely use prescription forms; rather, patient treatment books are used for documenting prescriptions. The pharmaceutical technologist stated that antibiotics are never dispensed without a prescription.

The pharmaceutical technologist is responsible for dispensing medications. Medications are dispensed into small triangles of paper. The pharmaceutical technologist has no special training in dispensing other than a basic diploma. The pharmaceutical technologist reported that the most common problem with prescriptions is adult dosages being written into prescriptions for pediatric patients.

Review of 30 copies of antibiotic prescriptions showed that the most commonly missing items on prescriptions were patient age, sex, and weight; route of administration of medicines; and prescriber name and serial number.

Dispensing is done out of a window that is poorly placed within the pharmacy. Medicines are dispensed into makeshift envelopes made out of plain paper. No dispensing labels are used. There was no opportunity to observe dispensing encounters at this facility.

Reference Materials

The only reference book available in the pharmacy was the *British National Formulary*.

AMPATH ART Program at Teso District Hospital [26]

Established in 2001 as a collaboration among Moi University Faculty of Health Sciences, Moi Teaching and Referral Hospital (MTRH), Indiana University School of Medicine, and Brown Medical School, the AMPATH program provides HIV/AIDS prevention, treatment, care, and support services to HIV-positive persons and their families in Kenya. AMPATH currently has around 8,000 patients in 10 clinical sites in Western Kenya and the Great Rift Valley, of whom around 4,000 are on ARVs. The AMPATH clinic in Turbo has a particular focus on truck drivers and commercial sex workers. AMPATH has funding to support a maximum of 30,000 patients on ARVs for the next 10 years. AMPATH clinics also provide nutritional support in the form of milk for infants and fresh produce, as well as support groups for people living with HIV/AIDS.

The AMPATH ART clinic at Teso DH was established in December 2004. In addition to providing free antiretroviral treatment, this clinic also provides free PMTCT from 28 weeks gestation, free OI prophylaxis, and free condoms for the prevention of OIs and STIs. In the

[26] Key informant: Dr. Chite, Medical Officer, AMPATH.

course of providing these services, AMPATH also carries out research. Additionally, AMPATH provides HIV/AIDS and PMTCT training for traditional birth attendants.

Located adjacent to the laboratory where VCT is carried out, the ART clinic currently operates only on Fridays from 8:00 AM to 5:00 PM. The clinic continues to operate as late as 7:00 PM if there are patients remaining who have not been served by closing time. The AMPATH clinic staff includes one medical officer (who travels from MTRH once a week), two clinical officers, and several nurses.

AMPATH stocks only about 55.5 percent of STI tracer commodities and 41 percent of OI commodities. This is because commodities are not kept onsite, but are brought to the clinic once a week by the clinic doctor. The key informant reported that the clinic had not experienced any stock-outs of STI or OI commodities normally stocked on the premises.

The ART clinic serves 25–32 clients per clinic day and distributes 1,000 condoms per week on average. The clinic has 140 PMTCT patients per month. Patients receive only nevirapine if the mother's first contact is during labor or if the mother has been on ART for less than two weeks before labor.

All patients are recruited through the Teso DH VCT center. About 20 new patients are referred per week. In the four weeks prior to the assessment, 82 new patients had been recruited into the ART clinic. AMPATH aims to have 100 percent recruitment into the ART clinic of HIV-positive persons identified through VCT so that they can access the range of services available. Ninety percent of HIV-positive patients coming through the VCT center do not require ARVs initially.

HIV/AIDS-Related Services

Treatment and Prophylaxis for Opportunistic Infections

The clinic handles approximately 25 OI prophylaxis patients per week, and usually one or two of these are also TB patients. AMPATH reports being the only NGO in Kenya that is allowed to provide TB prophylaxis. At present, patients are transported to Alupe and Bungoma for x-rays, but plans are under way to establish an x-ray facility at the ART clinic to avoid this in the future. At least 20 percent of patients presenting are reported to have oral candidiasis.

Commodity Management System

The AMPATH ART clinic currently stocks first- and second-line ART medicines used in the Kenyan national regimen. The ART clinic had 58.8 percent of tracer ARVs in stock at the time of the assessment. Only brand-name pharmaceuticals are used by AMPATH at present; AMPATH ceased to use generic medicines due to a bad experience with one particular generic brand. Currently, 8 out of 1,000 patients at all AMPATH sites are on second-line treatment; these are mostly patients who transferred from other ART programs or were previously on ART and paying out of pocket.

Quantification for ART is done by totaling the number of patients currently on ART and multiplying by frequency of refills, and adding the number of projected new ART patients

multiplied by the number of refills they would need. As a rule, the medical officer in charge of the ART clinic requests 30 extra packs of the standard regimens per month to cover new clients. Ordering is done by an ART clinic nurse using a request form. Orders are placed with the AMPATH office at MTRH, which forwards them to the AMPATH office in the United States. AMPATH's supply chain for ARVs is highly vertical in that all medicines are ordered directly from factories in the countries where they are manufactured. The lead time for orders is three to four months. AMPATH keeps a one-year buffer stock of medicines in Kenya for all its existing sites. In an emergency, AMPATH reserves the option of ordering ARVs through MEDS in Nairobi.

Storage and Record-Keeping

As mentioned previously, the ART clinic has no pharmacy, and medicines are not stored in bulk. Storage space in the clinic is very limited, and at the time of the assessment, there was no refrigerator in the clinic for storing items requiring refrigeration. Clinic staff basically manage medicines out of a briefcase and a carton kept in a drawer at the clinic. Plans are under way to eventually erect a prefabricated complex on the Teso DH grounds that will include a pharmacy, consulting rooms, and a patient waiting area.

No formal pharmaceutical register was being used at this clinic at the time of the assessment team's visit. Consumption records were being kept by clinic nurses.

Prescribing and Dispensing

The AMPATH ART program uses pre-printed prescription forms. The forms ask for most of the information required for ART prescriptions. A review was conducted of 30 prescriptions. Consistently missing information included patient age and sex and route of administration for medicines. A few prescriptions were written on scraps of paper, and these tended to contain less information than the prescriptions that were pre-printed.

Additionally, even though pharmaceutical names were pre-printed on the forms, strength was not always indicated (e.g., for co-trimoxazole, it was difficult to distinguish whether single or double strength was being prescribed).

The clinic's medical officer in charge and clinic nurses dispense ARVs and other medicines. Every other month, a pharmacist accompanies the medical officer to assist in dispensing at the clinic. The clinic setup was an obstacle to observing dispensing encounters. This was the only facility in the assessment found to be using dispensing triangles. Dispensing labels are not used in this program; instead, dispensing staff write information directly on the medicine packet.

Amagoro Medical Clinic[27]

Located in Amagoro, the administrative center of Malaba town, Amagoro Medical Clinic is a private medical clinic run by a retired clinical officer. The clinic is situated about 50 meters off the main road, approximately 10 kilometers from Malaba and halfway between Malaba and Teso

[27] Key informant: Mr. Epusi, retired Clinical Officer and member of the Clinical Officer's Council.

DH. The main clients of this clinic are civil servants, truck drivers, peasants, and farmers. The top three diseases seen at this clinic are malaria, diarrheal diseases, and respiratory tract infections. STIs are also common. According to the key informant, the patient population is poor, and few patients are able to contribute even half of the cost of their medical care.

Amagoro Medical Clinic is staffed by one clinical officer, one nurse, one lab technician, and one attendant. The nurse is responsible for managing health commodities. In principle, the facility is open 24 hours per day, 7 days per week, although it does not have inpatients. The facility has no telephone, and there is no dedicated mobile phone. The clinical officer in charge does not own a mobile phone, and instead uses commercial *sima ya jamii* (public pay telephones) for communications. Although the facility has electricity 24 hours a day, it experiences occasional blackouts. There is no backup generator. Despite the existence of a piped water supply, many problems are experienced with availability of water.

At the time of the visit, the clinic was in a state of poor repair. Although storage space was adequate, the pharmacy had a makeshift layout, and its fixtures were extremely old. The clinic had no refrigerator and no mechanisms for controlling temperatures such as air conditioning or fans.

HIV/AIDS-Related Services

Data collectors were informed that this was "the only facility of its kind" in Amagoro, meaning that no other private clinics with qualified personnel were operating at the time of the assessment. Amagoro Medical Clinic did not offer VCT services at the time at the time of the assessment. Although the clinic does not formally offer OI treatment—difficult cases are referred to Teso DH—it was found to have 58.6 percent of pharmaceuticals on the OI tracer list. Home-based care, palliative care, and services for orphans and vulnerable children are not offered at this clinic. Persons seeking ART are referred to Teso DH. The facility distributes condoms and provides STI treatment. The clinical officer in charge estimated that 10–15 confirmed PLHA attend the clinic per week.

Condom Distribution

Around 100 condoms are distributed per week at the clinic through a condom dispenser. The clinic obtains condoms from the Public Health Office.

Diagnosis and Treatment of STIs

Amagoro Medical Clinic diagnoses and treats 10–15 STI cases per week. Only the clinical officer in charge is trained in STI diagnosis and treatment; he received training from the DHMT in February 2003. Commodities used for STI services include VDRL test kits and medicines (primarily antibiotics). The facility had 72.2 percent of the items on the STI tracer list at the time of the survey. The facility does not experience stock-outs of the commodities it regularly stocks to treat STIs, although it is constrained by its budget when deciding how much to buy for the pharmacy. The facility buys VDRL test kits from the Bungoma or Busia pharmacies.

Commodity Management System

Procurement and Distribution

The clinical officer in charge determines what medicines to stock based on local epidemiology and knowledge of resistance patterns. The *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya* are not used to guide the selection of health commodities. The clinical officer has predetermined reorder levels of each item stocked. As he conducts periodic stock checks, he determines which commodities require "topping up." He then either orders supplies by telephone from Scorpion Pharmacy in Busia (which delivers items within 24 hours) or places a telephone order to Bungoma, which has a *matatu* (a small van for public transport) drop off the consignment at the clinic. Occasionally, medical representatives visit the clinic, and the facility also obtains items from these individuals.

Small orders to wholesalers are sent by messenger, and the facility pays the messenger's travel costs. This supply system is reliable, and rarely does the clinic experience any delivery delays, incomplete deliveries, or wrong or substandard goods delivered. The distance from the two major suppliers is 30 kilometers (Bungoma) and 50 kilometers (Busia).

Record-Keeping

A record-keeping system was not evident at the time of the assessment. The facility does not use standard methods such as registers or bin cards to track consumption, expiry dates, and other key data.

Prescribing and Dispensing

The clinic does not use prescription forms. Rather, prescriptions are written directly on a patient card, which the patient takes away. Dispensing is done by the enrolled community nurse. There was no opportunity to observe dispensing practices at this facility due to an absence of patients getting prescriptions filled.

Reference Materials

The facility has copies of the *Guidelines to Antiretroviral Drug Therapy in Kenya* and the *Guidelines for Prevention and Management of Opportunistic Infections and Tumours in HIV/AIDS*. However, it does not have the *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya* or the Kenya Essential Drugs List, nor does it have standard pharmaceutical references such as the *British National Formulary* or *MIMS*. The facility relies on pharmacology texts as references.

Garissa Chemist [28]

Garissa Chemist is 50 meters off the main road in Malaba, close to the border post between Kenya and Uganda. The majority of clients seen are truck drivers, although commercial sex workers and other local residents also frequent this shop.

The facility operates from 8:00 AM to 10:00 PM daily. The facility did not appear to be staffed by qualified personnel, although the staff present (one pharmacist, one pharmaceutical technologist, and two pharmacy aides) claimed to have pharmacy training. All staff dispense medicines. The staff were able to describe common health problems seen at this shop and the medicines commonly used to treat them.
The most common health problems seen at this pharmacy are urinary tract infections, typhoid, malaria, diarrhea (due to amebiasis), and respiratory infections. The staff serve at least five STI clients a day. The most common STIs are gonorrhea, syphilis, trichonomas vaginalis, and chancroid. There are some suspected HIV cases as well. The facility had 83 percent of the STI tracer list in stock and 65 percent of the OI tracer list available. The facility does not sell HIV test kits or condoms, but does stock latex gloves.

Few clients arrive at this pharmacy with prescriptions. Truck drivers tend to know names of medicines. Among the most frequent medicines requested are metronidazole (Flagyl), doxycycline, ciprofloxacin, and benzathine benzyl penicillin (Penadur). Kenyan CSWs are reported to not like buying medicines for treating STIs; instead, they usually send someone else to buy them. Ugandan CSWs are viewed by the staff as "more free" in getting medications because of anonymity. The staff felt that Kenyans CSWs would cross the border to buy medicines in Uganda for the same reason.

Commodity Management System

Procurement and Distribution

Selection of items stocked is based on patient demand. Generally speaking, Garissa Chemist does not stock generics because their major client base will not buy them. Another example given of client preferences was that clients prefer individually pre-packaged syrups because they are perceived to have better quality and safety. The pharmacist found that syrups bought in bulk were slow-moving and would expire because clients did not trust their quality enough to buy them.

The major suppliers for Garissa Chemist are Bungoma Chemists, Samulia (in Bungoma), and Harley's (in Kisumu). The lead time for obtaining goods is three days if the items are delivered by the supplier and one day if the staff collects the supplies. This shop did not have a formal mechanism for determining stock order level. It does not experience stock-outs, however, probably due to its ability to quickly fill emergency orders.

[28] Key informant: Mr. Muhammad Abdi.

Prescribing and Dispensing

The key informant reported that many problems are experienced with prescriptions brought to this pharmacy. Problems include writing the wrong dose for the condition and misspelling pharmaceutical names so that they could be confused with another pharmaceutical. An example of the latter problem was given where a provider wrote a prescription for Alaxin™ (cotexin) when the actual pharmaceutical indicated for the condition was Alexin™ (cephalexin). The pharmacy experiences at least one such mistake per day. The staff admitted to occasionally selling antibiotics without prescription, although they said they would sometimes refuse to do so based on the patient's symptoms.

Reference Materials

There were no pharmaceutical reference materials available in the shop.

Scorpion Pharmacy[29]

Scorpion Pharmacy is located in the center of Malaba, about 50 meters off the main road leading to the Kenya-Uganda border. Although the proprietor identified himself as a pharmacist, it later emerged from other interviews that he did not have formal qualifications as a pharmacist, pharmaceutical technologist, or clinical officer, despite the fact that a full range of health services are offered at this pharmacy, including medical consultation, administration of injections, and laboratory diagnosis in addition to the sale of health commodities. In the informant's view, "quacks," or providers without formal credentials or training, abound in Malaba and are even mentored by qualified clinical professionals. Indeed, quacks play a crucial role in health service delivery, and the quality of services they offer often outstrips even those offered at district hospitals.

Other staff reported to work at this pharmacy are a pharmaceutical technologist and a pharmacy assistant. The proprietor mentioned having affiliations with a laboratory technologist and a clinical officer, though the nature of these affiliations was not clear.

The hours of operation of this pharmacy are 8:00 AM to 8:00 PM daily. The pharmacy has access to electricity and water. However, power outages are frequent and may last as long as three days, resulting in the loss of all refrigerated items. Water supplied from a borehole on the compound gets contaminated when flooding occurs. The pharmacy has a fixed telephone line and a fax machine, but the service is erratic.

The clients at the facility are mainly drivers of large trucks. Some truckers seek consultation and treatment at the pharmacy rather than getting a medical consultation and prescription. Clients who have seen a clinician prior to arriving at the pharmacy tend to have seen multiple doctors. Few clients come with prescriptions. Although commercial sex workers also visit this pharmacy, they were reported to be "shy to visit." Male clients are more frequent customers and prefer to see male pharmacy staff. Other clients are members of the community, who are often poor and unable to afford an entire prescription or dose.

[29]Key informant: Mr. Joseph Omondi Ayeywe, proprietor of Scorpion Pharmacy, Malaba.

Many clients coming to the pharmacy have STIs. The most common STI is syphilis, with gonorrhea and other genital discharges also presenting frequently. Opportunistic infections arising from HIV/AIDS are occasionally seen. Truck drivers were reported not to be shy in disclosing to pharmacy staff that they have an STI, whereas members of the community are "shy" to admit having an STI. Few women from the community would come to the pharmacy to seek medicine for treating an STI. This pharmacy had available 100 percent of items on the STI tracer list.

This pharmacy had 93 percent of items on the OI tracer list in stock, as well as condoms and latex gloves. HIV test kits are not stocked, as there is no market for them. The proprietor refers clients presenting with OIs to MTRH or Kenyatta National Hospital, as he is not aware of HIV/AIDS services in Malaba—only of "opportunist doctors."

Commodity Management System

Commodity Supply

Selection of what to stock in the pharmacy is based on a combination of patient demand and the prescribing habits of local clinicians and quacks.

This pharmacy is supplied by wholesalers in Bungoma, Kisumu, and Busia who are able to deliver orders within a few days. Some of the more expensive products are bought from individuals suspected to have pilfered them from government facilities; these are sold to the pharmacy at "negotiable" prices.

The proprietor is particular about checking expiry dates on expensive products, due to the concern about losing money. Expensive medicines do expire on the shelves, however, because high prices make it difficult for many clients to afford them. These medicines include Fortum®, spectinomycin, Ciproxin®, togamycin, and fluconazole. The issuance of these medicines and others such as quinine is controlled, and pharmacy staff need to obtain the proprietor's permission before dispensing them. The proprietor believes that some generic products the pharmacy has been supplied are substandard and therefore ineffective.

Rational Use

Truck drivers are usually familiar with the names of the medicines they seek at the pharmacy. They tend to abandon treatment after a few days when they fail to see instant results and to seek new treatment. Others buy the same items over and over again from different sites as they travel, without seeking medical consultation. Truck drivers tend not to bring local partners in for STI treatment for fear of stigma. In those cases, pharmacy staff advise patients to use condoms or to bring their partner to the pharmacy under another pretext to obtain treatment. Still, most of such clients do not return with their partner.

This pharmacy dispenses to both patients and providers. For patients, first a treatment is supplied based on the proprietor's judgment; the patient is referred to a qualified medical provider if the treatment does not obtain a satisfactory response. Pharmacy staff reach an understanding with

patients that this is a "shooting in the dark" approach, although the pharmacy attempts to make more accurate diagnoses by performing basic lab tests onsite. The proprietor noted that quacks often abuse pharmaceuticals like gentamicin because they are cheap. This pharmacy dispenses antibiotics without a prescription.

The few prescriptions that are brought to the pharmacy sometimes contain mistakes, but it is usually not possible to reach prescribers to clarify matters arising from problem prescriptions.

Reference Materials

This pharmacy did not have any reference materials. The staff had never seen or heard of the *Clinical Guidelines for Diagnosis and Treatment of Common Hospital Conditions in Kenya, Guidelines for Antiretroviral Drug Therapy in Kenya, Guidelines for Prevention and Management of Opportunistic Infections and Tumours in HIV/AIDS,* or the national guidelines for VCT. The pharmacy also did not have any basic pharmaceutical references.

Figure 2 reflects availability of STI and OI medicines in all the facilities assessed in Teso District.

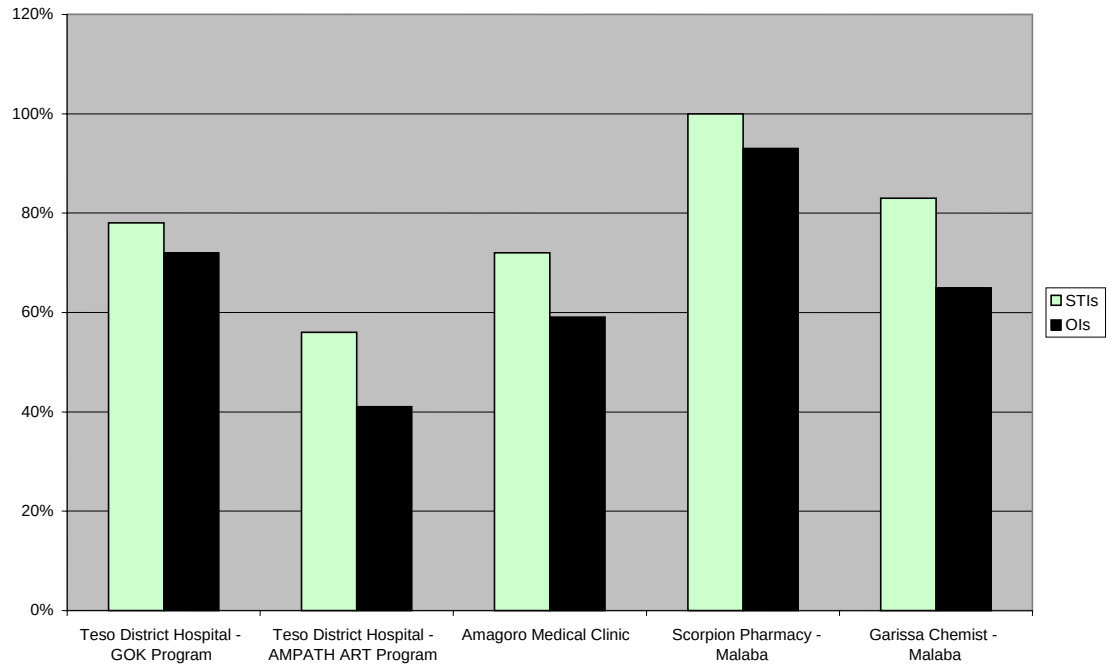

Figure 2. Availability of Medicines for Treating STIs and OIs in Malaba Area Facilities

ASSESSMENT FINDINGS: MARIAKANI

Community Characteristics

Mariakani is a small township that serves as the headquarters of Mariakani Location, Kaloleni Division of Kilifi District. The estimated population of the Kilifi District is 634,000 and that of the township is 40,000 residents. It is estimated that Mariakani has a transient population of around 2,000 at any one time. Most of the population derives its income from subsistence and cash crop farming and from raising livestock. Cash crops include cashew nuts, coconuts, and cassava. A minority of the population are salaried workers employed as teachers or in civil service. Mariakani is a semi-arid area, and each year's agricultural production is dependent on the amount of rainfall. During the day, this trading center is a quiet, sleepy town. At night, however, the population in Mariakani swells with the influx of 100–200 trucks that park on an eight-kilometer stretch that reaches from the main town to the weighbridge. Poverty is high in this community; health providers interviewed estimate that many residents in Mariakani earn about KES 50 or less per day.

An unexpectedly high number of health facilities are located on this eight-kilometer stretch (Figure 3). These include one public sub-district hospital, one public dispensary, nine private clinics (both for profit and nonprofit), and four private pharmacies. An army barracks located about two kilometers off the Nairobi-Mombasa highway also provides health services. The army barracks was included in the assessment because it expressed the desire to participate in the Northern Transport Corridor Initiative with a view to bringing VCT and ART services to the community. The sub-district hospital enjoys a good relationship with the health facilities and private pharmacies in the area.

NGOs providing HIV/AIDS services in Kilifi District include:

- AMKENI (behavior change and communication)
- FHI (condom distribution and training of VCT counselors)
- U.S. Centers for Disease Control and Prevention (ART at Kilifi District Hospital)
- Plan International (orphans and vulnerable children, home-based care, and IEC on HIV/AIDS and STIs)
- National AIDS Control Council (IEC)
- NARESSA (PMTCT)
- KEMRI (research)

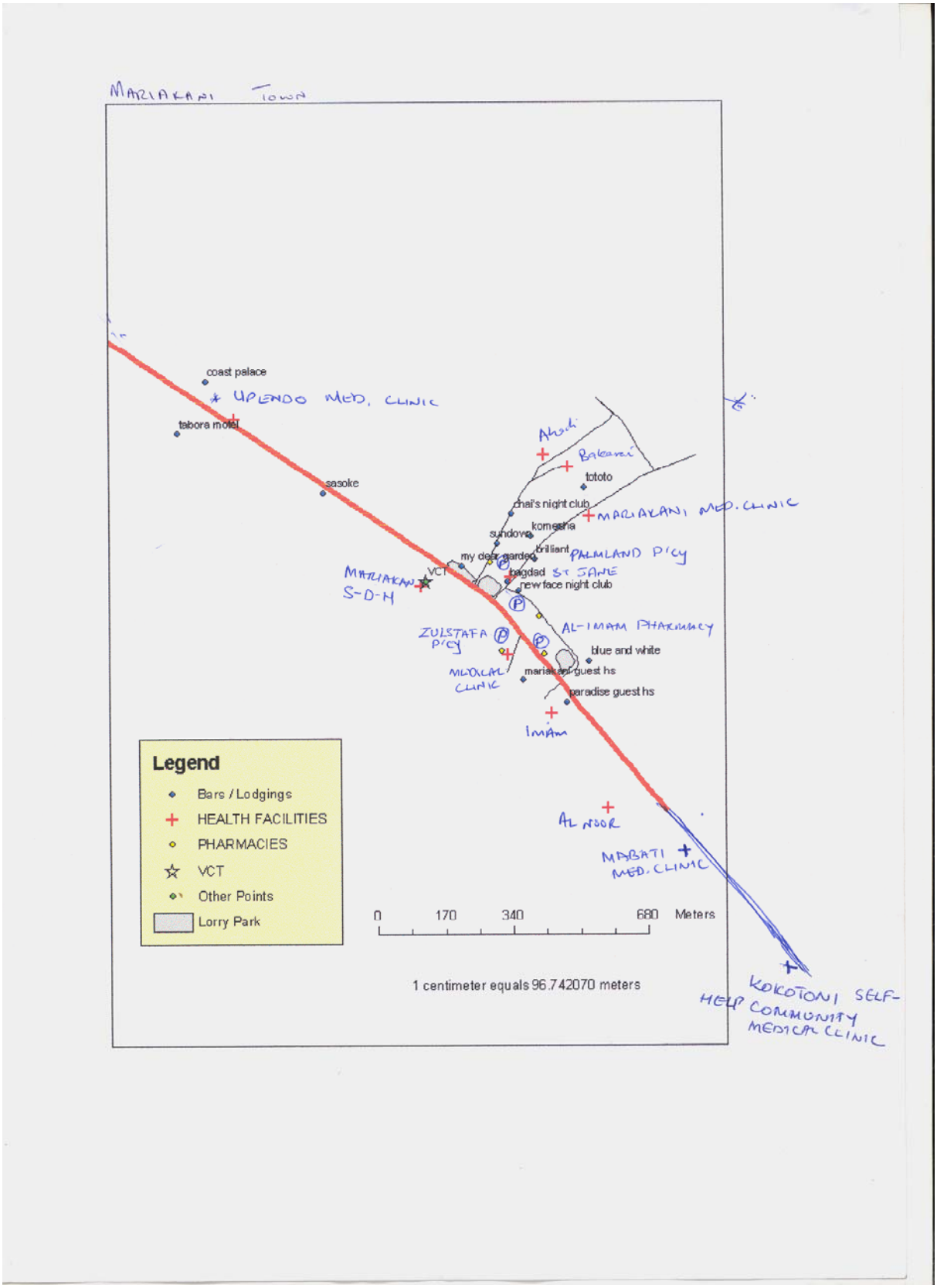

Figure 3. Location of Health Facilities in Mariakani Town

Facility Characteristics

The Mariakani assessment team[30] visited 8 of 16 health facilities and private pharmacies in Mariakani. The health facilities and pharmacies visited were selected on the basis of:

- Identification by community leaders as a source of health care and medicines for the community
- Consideration of possible faith-based preference for source of care (Muslim vs. non-Muslim)
- Geographical location (facilities serving key areas, such as the farthest ends of Mariakani township, the trading center, and the weighbridge)

A wide variation was found in the characteristics of facilities visited. The Mariakani Sub-District Hospital (SDH) was recently upgraded from its previous status as a health center. The 64-bed facility offers outpatient and inpatient services and enjoys the support of and a sense of ownership by the community. The private clinics range from single rooms, like St. Jane's Clinic and Ahadi Medical Clinic, to those with several ward beds and potential for expansion, like the Halima Medical Clinic. Most of these private clinics are owned by qualified health professionals (doctors, pharmacists, clinical officers, or nurses) who perform a range of functions in the facility, from consultations to dispensing to overall management. They are supported by locums (temporary health professionals) or patient attendants, who provide health care.

Much consistency was found in the practices of health facilities and private pharmacies assessed. Key informants were surprisingly candid, even in instances where government regulations were not being followed. All of the health facilities visited dispense medicines. They base their selection of what to stock on past prescription patterns. The facilities are similar with respect to their choice of suppliers, prices charged for medicines, and credit options offered to patients. Dispensing is often done by the same person who prescribes or by a nurse's aide or cleaner trained on the job.

Only two clinics base STI treatment on the MOH/NASCOP syndromic management chart. The others base STI treatment on past clinical experience, only occasionally sending difficult cases to the SDH for laboratory investigation and further clinical consultation. The assessment team noted that TB medicines were not available outside of the Mariakani SDH.

In general, the health facilities are poorly equipped. Laboratory equipment consists of a microscope and a sink where a few rapid tests can be performed. The labs have few qualified technicians or technologists. Patients requiring laboratory investigations are usually referred to the Mariakani SDH and less often to Coast PGH. None of the facilities (including the private pharmacies) had means of controlling temperatures through use of air conditioning or fans, and none had refrigerators to use for commodities.

[30] The Mariakani assessment team consisted of Rosalind Kirika, Senior Program Associate for MSH/RPM Plus, and Dr. John Majimbo Jao, consultant to MSH/RPM Plus.

Private pharmacies are well stocked with both human and veterinary commodities. Dispensing is mostly done without prescriptions, and most prescriptions that are filled originate from the sub-district hospital. Private clinics also keep stocks of medicines, which they source from local private pharmacies and dispense directly to patients.

Mariakani Sub-District Hospital[31]

Located 50 meters off the Nairobi-Mombasa highway, Mariakani SDH serves the population of Mariakani Location as well as that of Kwale District, which borders Kilifi District. Recent upgrades have provided the sub-district hospital with a new operating theater, which was launched during this assessment. This 64-bed hospital has one ambulance. Patients requiring referrals are referred to Coast Provincial General Hospital rather than Kilifi District Hospital because Coast PGH is closer and the road to Kilifi DH is in poor condition.

Patients at the hospital come from a variety of backgrounds. Truck drivers do not commonly seek services at the hospital because the availability of medicines in private pharmacies and clinics is higher and because those facilities provide faster services. The key informant noted that it is difficult to identify which patients are truck drivers. Facilities most commonly used by truck drivers are the St. Jane, Bakarani, Amani, and Pambazuko clinics and the Palmland, Beach, and Zulfikar pharmacies.

The top three conditions treated at this sub-district hospital are malaria, malnutrition, and respiratory diseases. Malnutrition and respiratory diseases are particularly common in children. The key informant could not estimate the proportion of patients seeking health care for complications of HIV/AIDS.

Outpatient clinical services at Mariakani SDH are available 24 hours a day, but the pharmacy and laboratory close at 4:30 PM on weekdays and operate half a day over the weekend. Telephone connections exist, but the telephone service has been disconnected for the past eight months due to nonpayment of bills. A plan had been proposed to provide senior hospital staff with funds with which to buy airtime for their mobile phones, but this was not implemented because the minimal cost-sharing funds generated by the hospital are primarily used to buy supplies.

Prolonged power outages are frequent in the area, and the hospital does not have a standby generator. The outages contribute to poor functioning or complete breakdown of existing refrigerators at the hospital. The facility has running water.

Staff at this facility include 1 medical officer, 5 clinical officers, 4 registered nurses, 11 enrolled nurses, and 1 public health officer. The laboratory is staffed by two lab technologists and two lab technicians. At the time of the assessment, the pharmacy was being run by the hospital matron with assistance from one patient attendant and two students from Mombasa Polytechnic on practical attachment. The two students carried out the bulk of the dispensing of medications. Although a pharmacist and a pharmaceutical technologist have recently been posted to this hospital, neither was present during the assessment. The key informant felt that this facility is

[31]Key Informant: Mr. Haji Musuko, Clinical Officer in Charge of Outpatients, Mariakani SDH.

inadequately staffed, as evidenced by the fact that certain services (e.g., ANC) cannot be offered on the weekend due to shortage of personnel. No plans are under way to address the personnel shortage.

This facility does not charge patients for certain services, namely malaria treatment, health services to children under five years, and ANC. This is in keeping with a GOK directive passed in 2004 that prohibits charging patients for these specific conditions. Adults pay KES 20 for registration and are charged separately for medicines, x-rays, and laboratory services. A system of exemptions exists for patients who cannot meet the registration fee. Pharmaceuticals are purchased "per dose" rather than by individual unit. The amount paid for each dose is the same for a given medicine, regardless of how many units are in the dose. For example, a patient will pay KES 30 for a dose of paracetamol, regardless of whether the dose for the given patient's condition is 18 tablets or 6 tablets.

HIV/AIDS-Related Services

HIV/AIDS-related services are currently limited to the Mariakani SDH, but plans are under way for additional services. Current services include VCT, condom distribution, STI diagnosis and treatment, and OI treatment and prophylaxis. The AMKENI project provides IEC in the form of morning lectures in the outpatient department.

VCT

The VCT center began providing services in October 2003. Although several hospital staff are trained to provide VCT, the center has only one full-time counselor. The other staff work part-time at the VCT center and part-time in other departments of the hospital, such as the lab. The result of this staff shortage is that during normal working hours, the VCT center is only open sporadically. In July 2004, 575 patients were provided with VCT services, of whom 31.6 percent of females tested positive while 13.3 percent of males tested positive. A high proportion of VCT clients are referred from outside the hospital. Currently, patients testing positive are referred to Coast Provincial General Hospital to determine eligibility for ART. Plans are under way to start an ART program at Mariakani SDH in April 2005, and the VCT center already has patients on a waiting list.

KEMSA supplies the commodities used at this VCT center. Four of the five VCT commodities on the tracer list were available at the center. This center uses primarily Determine HIV 1/2 test kits. Uni-Gold kits are available but are used less frequently. The hospital does serial testing, as required by GOK protocol. Test kits are stored in the hospital laboratory. The lab technologist observed that it would be preferable to stock Capillus kits for use by non-laboratory staff, as these are easier to use. The counselor/lab technologist also supervises the VCT centers at Rabai Hospital and St. Luke's Hospital in Kaloleni.

Condom Distribution

Approximately 1,000 condoms are distributed through the VCT center per week.

Diagnosis and Treatment of STIs[32]

This facility sees an average of five STI cases per day and provides treatment based on the syndromic approach. Key informants reported that the number of STI cases seen at the hospital seems to be on the decline.

The hospital pharmacy receives STI kits from KEMSA. At the time of the assessment, the pharmacy had only 22 percent of the products on the STI tracer list. RPR kits are available for the diagnosis of syphilis. Although this facility was upgraded to a sub-district hospital and should receive an SDH-sized STI kit, it is still receiving a HC-sized kit, which is insufficient to serve its patient load. The last time an STI kit was received from KEMSA was in October 2004. Since then, the hospital has had to purchase STI medicines out of its own funds from the user fees.

The pharmacy usually makes up for this shortfall by "borrowing" medicine for treating STIs from the general hospital stock and returning the borrowed medicines when the STI kits arrive. Effectively, this meant 50 percent of STI medicines were available for dispensing to patients. The key informant speculated that it was possible that fewer STI cases were being treated at the hospital due to lack of medicines, but he felt that the smaller number of cases was more likely due to a lower incidence of STIs.

Treatment and Prophylaxis for Opportunistic Infections

This facility currently has three patients on OI prophylaxis using co-trimoxazole and provides diagnosis and treatment of opportunistic infections. Of the 29 OI tracer products, 20 (69 percent) were available. Of those out of stock, most were antifungal medicines. This has serious negative implications for patients, as fungal infections are common in PLHAs. The hospital has 1,011 patients on TB therapy. Since TB treatment is initiated at Kilifi District Hospital and only the non-intensive portion of TB therapy is done at Mariakani SDH, not all the TB products on the tracer list were available at Mariakani SDH at the time of the assessment. However, sufficient supplies were available for Mariakani's current TB patients.

Commodity Management System[33]

The hospital has one pharmacy containing a small drug store used for dispensing supplies for the wards. The key for this small drug store is kept by the matron. Although this small area is neatly organized, some of the medicines on its shelves were near expiry.

[32] Key Informant: Mr. Haji Musuko, Clinical Officer in Charge of Outpatients, Mariakani SDH.
[33] Key informant: Joyce Juma.

There is also a bulk store located in one of the new wards. This bulk store does not have adequate security. However, it has been fitted with shelving and has good storage space. Until the time of the assessment, the hospital administrator had been in charge of the stored pharmaceuticals. This function was to be taken over by the pharmacist and pharmaceutical technologist a week after the assessment.

The spacious pharmacy has two dispensing windows, only one of which is actually used for dispensing. The second window is used by a cashier for receiving payments for products sold at the pharmacy and for services rendered at the laboratory. The pharmacy has no designated pre-packing area, even though sufficient space exists for this. A covered waiting area provided for patients is adequate.

The pharmacy has running water, electricity, and a working refrigerator. The pharmacy has no means for controlling ambient temperature (which was above 30°C [86°F] at the time of assessment), and pharmacy staff expressed the need for air conditioning or ceiling fans as a remedy.

Quality of medicines in this pharmacy is of concern. At the time of the assessment, there was a large amount of sulfadoxine-pyrimethamine syrup in stock, but all of it had caked. Ergometrine injection was improperly stored in the freezer compartment, leading to a freezing over of the solution and breakage of some ampoules. Approximately 500 ampoules were about to be discarded for this reason. Products such as chloramphenicol capsules, procaine penicillin injection, and Uni-Gold test kits were close to expiry. The problem of products being close to expiry results in part from the inflexibility of the kit system and the fact that there are no commodity exchange procedures in place.

Procurement

KEMSA is the main supplier for the SDH and is supposed to supply medicines on a quarterly basis, but it does not usually meet this goal. Procurement outside the KEMSA system is initiated by a small committee, comprising the hospital administrator, the matron, and the pharmacy attendant. The committee draws up a list of the facility's requirements and floats tenders. This process (selection and tendering) takes up to two months to complete, so pharmaceuticals can be out of stock for two months or more. The administrator makes the final decision on what to buy based on the available funds.

Record-Keeping

Bin cards are not used at this facility. Registers are used for antibiotics and STIs only; the antibiotics register is actually an adjusted STI register. The wards send orders on improvised S-11 forms as these forms are not available at the moment. Prescriptions are written only for antibiotics. These are written on any piece of paper, but must be stamped with the official stamp. After they are recorded in the antibiotics register, antibiotic prescriptions are stored in cartons in the pharmacy. For general pharmaceuticals, the record of the prescription is kept in the outpatient register and the notebook that is owned by the patient. There is, therefore, a paucity of records relating to pharmaceutical management within the hospital.

Dispensing

Dispensing is done by a patient attendant who has worked in the pharmacy for two and a half years. At the time of the assessment, two first-year pharmacy students were also dispensing. They were working unsupervised but would check each other's work for accuracy. Dispensing staff did not check for the patient's understanding of instructions, although the patient did have the opportunity to clarify instructions for taking medications, given that the dispensing process was unhurried. Labeling of medications was below standard.

Reference Materials

The pharmacy had a tattered copy of the 27th edition of *Martindale*. The VCT center has copies of the *Guidelines to Antiretroviral Drug Therapy in Kenya,* the *National Guidelines for Voluntary Counseling and Testing,*[34] and the *National Home-Based Care Programme and Services Guidelines*.[35] In addition, the laboratory technologist has written out the process for HIV testing and pinned it over the sink for ease of reference, particularly for his colleagues who are not as well versed in HIV testing.

Mabati Rolling Mills Clinic

Established to serve the staff and dependents of the Mabati Rolling Mills factory,[36] the Mabati Rolling Mills Clinic is also open to members of the community and is located where patients can access the facility without entering the factory grounds. This clinic operates from 8:30 AM to 5:00 PM each weekday (Monday through Friday). Services include family planning and ANC, in additional to general medical services. The most common conditions seen at this clinic are malaria, respiratory tract infections, and urinary tract infections.

The clinic is supervised by a clinical officer, who also attends all the patients. Each day, 40–50 patients are treated. The clinical officer is assisted by two nurse's aides and one patient attendant for the pharmacy, who has been trained on the job. This level of staffing is insufficient to meet the needs of patients, and tremendous demands are placed on the clinical officer, to the extent that he cannot participate in continuing medical education because no replacement is available to take over in his absence. The clinic is well stocked with medicines and is in a good state of repair.

The clinic charges a flat rate of KES 100 to cover consultation and medicines. Any patient requiring laboratory services is sent to Al Noor Medical Clinic, where the patient must pay 100 percent of the costs. Since Al Noor Medical Clinic is a private facility, there are no exemptions for the cost of laboratory services.

[34] Kenya Ministry of Health National AIDS and STI Control Programme (NASCOP). 2001. *National Guidelines for Voluntary Counseling and Testing*. Nairobi: NASCOP.
[35] National AIDS/STD Control Programme. 2002. *National Home-Based Care Programme and Services Guidelines.* Nairobi, Kenya: Ministry of Health.
[36] Key informant: Julius Were, Clinical Officer.

This clinic has a functioning fixed telephone line, running water, and electricity. The clinic has a generator in case of power outages.

HIV/AIDS-Related Services

HIV-related services provided at Mabati Rolling Mills Clinic are limited to condom distribution, STI diagnosis and treatment, and treatment of opportunistic infections. Plans to expand these services are under way.

Condom Distribution

Approximately 200 condoms are distributed per week at the clinic.

Diagnosis and Treatment of STIs

On average, 25 STI cases are seen per week at the clinic. Diagnosis and treatment are based on the syndromic approach and clinical experience. Outside what is taught in preservice training, the clinical officer has not had any training in STI management. Seventy percent of the products on the STI tracer list were available.

Treatment and Prophylaxis for Opportunistic Infections

Fifty-eight percent of items on the OI tracer list were available at the clinic. Of those out of stock, most were antifungals and anti-TB medicines. All patients on TB therapy obtain their medicines from Mariakani SDH.

Commodity Management System

This clinic has one small dispensing room, which is staffed by one attendant. Bulk medicines are stored in cabinets in a room adjacent to the consultation room, an arrangement that gives the clinical officer good control over which medicines are issued by the attendant.

No problems with quality of commodities were reported at this facility. The key informant attributes this to a good choice of supplier, which the facility has used consistently for several years. Stock-outs are infrequent at this facility and last two to three days at the longest.

Procurement

Products are procured weekly. Procurement is done by a staff committee that has oversight of the clinic. The clinical officer is the secretary for this committee, and he prepares and sends the final order. The main supplier to this clinic is C. Mehta & Co. Ltd. in Mombasa town.

Record-Keeping

Bin cards are not used in this facility. A register is used for all pharmaceuticals and is kept up to date. A well-functioning maximum-minimum system exists to ensure that adequate stock is

maintained for each product normally stocked in the facility. Prescriptions are not used at this facility; dispensing is done from the treatment notes.

Dispensing

Dispensing is performed by the patient attendant, who has worked in the pharmacy for several years. Dispensing materials are available and adequate, but the dispensing process is not up to standard. Since the dispenser has no immediate supervisor, dispensing protocols would be an invaluable resource in this setting.

Reference Materials

Reference materials are very limited at this facility. Those available include *Textbook of Medical Treatment*,[37] the MOH/NASCOP STI syndromic management chart, and the *Guidelines for Prevention and Management of Opportunistic Infections and Tumours in HIV/AIDS*.

Bakarani-Halima Medical Clinic[38]

The Bakarani-Halima Medical Clinic is a large, well-laid out facility located 300 meters off the main road. The clinic has two consultation rooms, a laboratory, a dispensary, a drug store, an x-ray room, a ward with beds that can accommodate up to 20 patients, and a delivery room. An operating theater is proposed.

This facility is one of a chain of three clinics owned by a medical officer. It is staffed by one medical officer, one clinical officer, three community nurses, and one laboratory technologist, all of whom work part-time. There is also an administrator who works full-time.

The clinic is open 24 hours a day. At the time of the assessment, the electricity had been disconnected due to nonpayment of bills. The clinic has functioning fixed telephone lines and dedicated mobile telecommunication lines. A functioning refrigerator is available for laboratory kits and other products needing cold storage. The facility has running water.

The most common medical conditions seen at this clinic are malaria, typhoid, STIs, and upper respiratory tract infections.

HIV/AIDS-Related Services

HIV/AIDS-related services provided at this clinic are limited to condom distribution, STI diagnosis and treatment, and treatment of opportunistic infections.

[37] Alstead, S., and R. H. Girdwood, eds. 1978. *Textbook of Medical Conditions*. 14th ed. Edinburgh: Churchill Livingstone.

[38] The key informant was the administrator, Mzee Kombo. Later, an interview was granted by the doctor/owner, Dr. Abeid Kombo, at one of the other sites.

Condom Distribution

This clinic sells condoms. It does not distribute any free condoms because it does not receive condoms from any of the HIV/AIDS projects in the area.

Diagnosis and Treatment of STIs

The facility treats about five STI cases a week. STI diagnosis is done through clinical presentation and laboratory tests (urinalysis, VDRL, and RPR). When required, culture and sensitivity tests are carried out at the chain's main clinic in Mombasa town. The clinicians keep up with developments in STI treatment through internal sharing of information, but no formal continuing medical education courses were mentioned. Of the 18 products on the STI tracer list, 14 items were available. The doctor comes to the clinic daily, so even if the product is not in stock at the time of prescribing, it can be quickly obtained from him.

Treatment and Prophylaxis for Opportunistic Infections

Sixty-nine percent (20 of 29) of the items on the OI tracer list were available at this clinic. Of those out of stock, five were TB medicines, primarily because TB patients obtain their medicines at the sub-district hospital. Antifungal medicines not available have to be purchased by patients at private pharmacies using a prescription issued by the clinic. Clinicians on duty see at least one patient a month who presents with opportunistic infections suggestive of HIV disease. Such patients are usually referred to the Mariakani SDH or Coast PGH.

Commodity Management System

The pharmacy is well stocked and has a separate drug store. Stock-outs are reported to be rare. The refrigerator for storing laboratory reagents is in good working condition. There are no wall thermometers or refrigerator thermometers, and Mariakani can have high temperatures (as high as 34ºC [93.2ºF] during the assessment). However, not much stock is held at the pharmacy, which reduces the likelihood of spoilage of products due to high temperature.

With respect to product quality, the informant recalled at least three instances of products being supplied without labels; these products were returned to the supplier. The clinic was at one time supplied with a particular brand of rapid pregnancy test kits, which took unusually long to react and gave inaccurate results.

Procurement

Although the key informant reported that selection is based on the national STGs, it was clear during the assessment that it is the doctor/proprietor who selects the products used and dispensed at the clinic. The nurse in the pharmacy prepares the list of requirements, which is then reviewed by the doctor, who decides what should be procured. Almost all commodities are purchased from Mombasa town, where one of the major suppliers is Shifa Chemists. The longest lead time the facility has experienced for products is two days.

Record-Keeping

A nurse maintains an antibiotic register as well as one for other medicines. Bin cards are not used at this facility. There is no written tracking of ambient or refrigerator temperatures. The clinic does not supply pharmaceuticals except to those patients they have attended to. The records kept are adequate for assessing needs and to cover legal requirements.

Dispensing

Dispensing of medicines is done by one of the enrolled nurses who staff the pharmacy or by the clinic administrator, who is a retired nurse. Prices paid by patients for products from the pharmacy include a 50 percent markup on the wholesale price. It was not possible to observe dispensing encounters, as no dispensing occurred at the time of the assessment visit.

Reference Materials

National guidelines available at this facility included guidelines on the treatment of sexually transmitted infections and the national malaria treatment guidelines. The only pharmaceutical reference available was one copy of the 2002 edition of *MIMS*.

Kavinautu Medical Clinic

The Kavinautu Medical Clinic is located near the end of the weighbridge, just after the trucks pass the checkpoint. The hours of operation are from 8:00 AM to 6:00 PM daily. The facility is owned by a husband and wife team, both of whom are qualified nurses; one works in the army barracks and the other at the Mariakani SDH. The assessment interview was conducted with a nurse's aide/cleaner who attends to patients when the owners are not available. For her level of training, she was surprisingly conversant with the types of treatment provided at the clinic. She was also aware of her own limitations in being able to provide care for patients.

The facility comprises one large room with temporary partitions for the various functions performed at the clinic. Data collectors were informed that the clinic proprietors had expansion plans. The facility has neither running water nor electricity, and hardly any medical equipment. An ingeniously protected cabinet serves as a drug store.

The majority of clients at this clinic are local residents. Fewer patients are nonresidents, and the key informant found it difficult to determine whether these are truck drivers or not. The health problems commonly seen at this facility are malaria, upper respiratory tract infections, and STIs. The patient load at this clinic is light. Patients find it difficult to pay the full cost of care and often have to make payments in two or three installments.

HIV/AIDS-Related Services

Services are limited to condom distribution, STI diagnosis and treatment, and treatment of opportunistic infections. One of the nurses is a trained counselor and therefore counsels patients she suspects of having contracted HIV and refers them to Mariakani SDH.

Condom Distribution

About 100 condoms are distributed per week. These are left out on the window ledge at night and people help themselves. A condom dispenser is to be installed soon with the assistance of Mariakani SDH.

Diagnosis and Treatment of STIs

The nurse's aide reported that about two STI cases per week are seen at the clinic. STI treatment is based on the syndromic approach using the GOK guidelines. An outdated version of the MOH/NASCOP syndromic management chart is available for use in the clinic. Data collectors provided the clinic with updated guidelines. The facility had 78 percent (14 of 18) medicines on the STI tracer list available.

Treatment and Prophylaxis for Opportunistic Infections

Sixty-nine percent (20 of 29) of tracer products for treating opportunistic infections were available at the time of the assessment. Five of the products on this list that were out of stock were TB medicines, and the remainder were antifungals, which are too expensive to stock. TB patients collect their medicines at the Mariakani SDH. Patients are given prescriptions for the antifungals, and these are filled at private pharmacies.

Commodity Management System

The nurse/proprietors are fully responsible for the management of pharmaceuticals. Commodities are stored in a cabinet in the clinic. Medications used for working stock are pre-packed and stored in a container on the consultation desk so that the nurse's aide can dispense them as she attends to patients. There is no air conditioning or other means of controlling ambient temperature; however, few medications are kept in stock at the clinic, so spoilage due to heat is minimized.

Procurement

Most commodities used and dispensed at this clinic are purchased from Palmland Pharmacy at the Mariakani trading center. The proprietor decides what to purchase and procures accordingly. Medications sold at the clinic have a markup of 5–10 percent, depending on the patient's ability to pay.

Record-Keeping

Records consist of antibiotic registers maintained by the nurse. Ambient and refrigerator temperatures are not recorded. Records of unfilled patient prescriptions are held in the patient register. No specific records are kept, but procurement receipts and invoices are filed for accounting purposes

Prescribing and Dispensing

Dispensing is done by whichever prescriber (nurse/proprietor, nurse's aide) is attending to patients, since the medicines are stored in the same room. Medicines are pre-packed for the nurse's aide, who dispenses and charges accordingly. Injections are not commonly prescribed, perhaps because the nurse/proprietors who are qualified to administer them spend little time here because they also work elsewhere.

The key informant mentioned that problems had been found with the quality of hydrocortisone injection (the powder would dissolve into a milky solution). The data collectors felt that the problem may have arisen from prolonged use of the water for injection, which was from a multidose container that had been open and in use for three months. Advice on the need to procure a smaller pack of water for injection, which would be used more quickly, was given by the data collectors and apparently well taken.

Reference Materials

The only reference material available in this clinic was an outdated MOH/NASCOP STI syndromic management chart. Data collectors provided current GOK literature on STI treatment[39,40] to clinic staff upon conclusion of the interview.

St. Jane's Medical Clinic and Clinical Laboratory

Located 100 meters off the main road in Mariakani, the St. Jane's Medical Clinic and Clinical Laboratory, a private facility, is owned by a husband and wife team and operates from 7:30 AM to 6:00 PM daily. The staff includes a clinical officer (the owner), one nurse, and one nurse's aide/receptionist. Occasionally, clinical officers who work at Mariakani SDH are employed as locums. The clinic also has a makeshift laboratory.

The most common medical conditions treated at this clinic are malaria, upper respiratory tract infections, diarrhea, vomiting, and skin diseases. The clinic has a large number of patients, most of whom are residents of Mariakani. The clientele is composed mostly of teachers, housewives, and subsistence farmers. This clinic maintains a reputation in the community and with the Mariakani SDH staff for ensuring good medical care. Patients pay one fee that covers the consultation and medicines. Fees are set according to the patients' ability to pay.

The infrastructure of this clinic is basic and rundown. The clinic has a fixed telephone line and a dedicated mobile telephone line. The facility has running water and a sink with a washing area in the room where the microscope is stored. This room serves as the laboratory, and a small refrigerator is stored there.

[39] National AIDS and STI Control Program, Ministry of Health (MOH). n.d. *Management of Sexually Transmitted Infections.* Nairobi, Kenya: MOH.
[40] Ministry of Health (MOH). n.d. *Maelezo Kuhusu Magonjwa Tegemezi.* Nairobi, Kenya: MOH.

HIV/AIDS-Related Services

Services include condom distribution, STI diagnosis and treatment, and treatment of opportunistic infections.

Condom Distribution

This facility sells more than 25 condoms per week. It is not able to distribute free condoms because it is not supplied with condoms by any of the programs distributing free condoms to private clinics in the area. Although it was not explicitly stated, this would appear to be out of choice rather than reluctance by the SDH to provide free condoms to the clinic.

Diagnosis and Treatment of STIs

Approximately three STI cases are treated at this clinic per week. STI treatment is based on the syndromic approach using the GOK guidelines. The clinical officer has undergone STI training coordinated by NASCOP and the Kilifi District Hospital. A few simple STI tests are conducted in the makeshift laboratory. Fifteen of 18 items (83 percent) on the STI tracer list were available at the time of the assessment.

Treatment and Prophylaxis for Opportunistic Infections

The clinical officer estimates that he sees at least one person with suspected opportunistic infections related to HIV infection per week. He usually refers them to the SDH for further evaluation because they can obtain cheaper and more comprehensive treatment there. Sixty-nine percent (21 of 29) of tracer items for treating opportunistic infections were available at the clinic at the time of the assessment. Of the seven items out of stock, five were TB medicines. Patients are normally referred to the SDH for TB medications.

Commodity Management System

Selection of products is based on the clinical officer's judgment of what items should be stocked by the clinic. Upon being presented with a copy of the latest GOK standard treatment guidelines, the clinical officer stated that these guidelines could help improve his clinical decision making and rationalize his selection of items for the clinic.

Pharmaceuticals are stored in a cabinet in the consultation room. Commodity management is supervised by the clinical officer, although much of the practical responsibility rests on the nurse's aide who does much of the dispensing. The clinical officer feels that generally, there is good availability of commodities, although the clinic often lacks Depo-Provera.

Procurement

Procurement is done by the clinical officer/proprietor. Once he determines the clinic's needs based on his personal judgment, he places orders directly from chemists in Mombasa town. Emergency orders are placed with local chemists in Mariakani. The clinical officer procures small quantities of commodities to avoid loss from expiry. The clinic has experienced numerous

quality problems with sulfadoxine-pyrimethamine suspension. As a result, the clinical officer now double-checks this product when it is delivered.

Record-Keeping

Bin cards are not used for tracking stocks at this clinic. Records for antibiotics and for other medicines are maintained by the nurse in a pharmaceutical register. The register was adequate for the stocks held. Occasionally, prescriptions from outside the clinic are dispensed. Copies of these prescriptions are filed. The clinical officer dispenses from the patient notes and rarely issues prescriptions, preferring to procure the medicines required and dispense to the patient at the clinic.

Prescribing and Dispensing

Patients can obtain medicines without a clinical consultation, but the clinical officer prefers to see the patient before anything is dispensed. The nurse's aide dispenses medicines under the supervision of the clinical officer. In general, the price of medicine has a markup of 5–10 percent above the wholesale price. Dispensing labels lack essential information. Labels contain only the frequency of administration (e.g., 1 × 3), but not the patient name, medicine name, or duration of treatment.

Reference Materials

The facility had several GOK guidelines at the time of the assessment, namely the national STI, ART, PMTCT, and malaria guidelines. The only pharmaceutical reference available was a copy of *MIMS* from the year 2000. The clinical officer maintains contact with the MOH for Kilifi District Hospital, which facilitates his access to attending continuing medical education courses.

Palmland Pharmacy [41]

Palmland Pharmacy is a busy private facility located 100 meters off the highway. It also serves as a wholesaler to health facilities in Mariakani. Open from 7:30 AM to 8:00 PM daily, this pharmacy is staffed by one pharmacist and three attendants, all of whom dispense medications. Palmland Pharmacy's suppliers are in Mombasa town.

This pharmacy is in a good state of repair and has running water, electricity, and fixed telephone lines. However, the pharmacy experiences frequent power outages, which is problematic given that there is no generator, ambient temperatures are high, and the pharmacy holds large stocks of medicines. The pharmacy does not track ambient or refrigerator temperatures.

Clients of this pharmacy are primarily truck drivers, local residents, and the mobile population of the township. All clients pay for medicines out of pocket, and a small minority are reimbursed by their employers. Inability to pay for medicines is the major contributing factor in limiting access to medicines observed by pharmacy staff. Medications are sought mainly for malaria, STIs, and respiratory infections.

[41] Key informant: Dr. Matano Konde, Pharmacist/Manager.

The pharmacy serves 10–15 clients with STIs daily. Some of these patients are referred from the SDH and from the Bakarani and Al Noor medical clinics. The staff of the pharmacy have not received any training for STI treatment. The pharmacy had 100 percent of medicines on the STI tracer list in stock.

With the exception of TB medicines, all items on the tracer list for opportunistic infections were available. This is because all TB patients collect their medication and have their treatment supervised at Mariakani SDH. Two out of five items commonly used in VCT were in stock (latex gloves and condoms). The pharmacy sells almost 100 condoms per week. It has no contacts or arrangements with any of the projects that are running IEC campaigns on HIV/AIDS. There were no complaints about the quality or availability of products. The facility does not stock ARVs at present.

This pharmacy is computerized. Commodity orders are generated automatically. The main supplier is Ocean View Pharmaceuticals in Mombasa, which is 40 km away. The longest delay in receiving supplies is six hours.

Beach Pharmacy

Beach Pharmacy is located just 50 meters off the road. It is a spacious facility that sells both human and veterinary products. It is staffed by three pharmaceutical technologists and is open from 7:30 AM to 8:00 PM daily. The facility is in good repair and has running water, electricity, and both fixed and mobile telephone lines. The facility also has a large refrigerator. However, there is no temperature control in the form of air conditioning or fans. There is also no system for recording and tracking temperatures.

Clients are mainly truck drivers, staff from Mabati Rolling Mills Clinic, and residents of the township. Most clients seek medicines to treat STIs, typhoid, and malaria.

The facility stocks condoms and sells about 4×24 packets at retail prices and another 6×24 packets at wholesale prices per week. The pharmacy attends to about 10 STI patients a day. All items on the STI tracer list were available at this pharmacy. The managing pharmaceutical technologist has received training in STI treatment from FHI, as well as training in educating the community on HIV/AIDS, also from FHI. This is part of the quarterly continuing education the pharmacy organizes for its staff. With the exception of TB medicines, all items on the OI tracer list were available.

Stock-outs are not a problem for this pharmacy. The manager uses visual judgment to decide what to reorder and when to do so. The main suppliers are the Ocean View, Jaden, and Shifa chemists located in Mombasa town. Stock is also exchanged with the facility's sister pharmacy in Ukunda. Quality problems have been experienced with veterinary products in particular—specifically, poor-quality products and poor labeling.

The key informant stated that the pharmacy keeps registers for both antibiotics and general pharmaceuticals, but he was highly reluctant to allow data collectors to view these.

Al Imam Pharmacy

The Al Imam Pharmacy is very busy despite being located 300 meters off the highway, farther than some other facilities. It is a spacious facility that sells both human and veterinary products. It is staffed and owned by a pharmacist and a clinical officer, who are a husband and wife team. The pharmacy is operational from 7:30 AM to 7:00 PM daily. The facility is well arranged and in good repair. It has the necessary amenities, including running water, electricity, both fixed and mobile telephone lines, and a refrigerator. However, there is no temperature control in the form of air conditioning or fans. There is also no system for recording and tracking temperatures.

Clients are mainly residents of the township. Most clients seek medicines to treat malaria, STIs, and respiratory tract infections. The pharmacy has a strict code on selling adequate dosages for each condition. Prior to the interview, the data collectors observed the diligence with which the clinical officer "diagnosed" the patient's need before offering what he considered a correct dose, then insisted on the patient getting the correct amount.

The facility stocks condoms and sells about 50 per week at retail prices. The pharmacy attends to about 5–10 STI patients a day. All items on the STI tracer list were available at this pharmacy. The managers have not received training in STI treatment, but have updated their knowledge using the MOH guidelines. With the exception of TB medicines, all items on the OI tracer list were available.

Stock-outs are not a problem for this pharmacy. The manager uses visual judgment to decide what to reorder and when to do so. The main suppliers are C. Mehta & Co. Ltd. and Shifa Chemists located in Mombasa town. Quality problems have not arisen or been noticed.

The trade-related documents are neatly and completely filed in one file. The data collectors were informed that there was a register for antibiotics, but were not given an opportunity to examine it.

Two other facilities merit a special mention: the barracks of the 77th Battalion and the Al Noor Clinic.

77th Battalion Barracks

The clinic in the barracks of the 77th Battalion of the Kenyan Army serves the approximately 500 officers of the battalion based at Mariakani and their dependents. Ideally, this community seeks care only at this facility and any referrals are to the Forces Memorial Hospital in Nairobi. In emergency situations, care is obtained at the Coast Provincial General Hospital. All services are provided free.

The facility is located within the barracks, which is about two kilometers off the Nairobi-Mombasa highway. It is well served by public transport from Mariakani. At the moment, the clinic is open only to the battalion's officers and their dependants, but there was an expressed desire to serve the surrounding community and get involved with HIV/AIDS control programs.

The clinic is under the oversight of a medical officer, but at the time of the assessment, he was away for continuing medical education in Nairobi. A Kenya registered nurse was in charge. In total 14 professionals staff the clinic: 1 medical officer, 1 clinical officer, 1 Kenya registered nurse, 10 enrolled nurses, and 1 public health officer. The nurses manage the drug store.

Services are provided 24 hours a day, 7 days a week. The clinic has all the necessary amenities: water, electricity, a standby generator, telephone network (land and mobile), and good refrigeration for supplies. The space is limited, but more can be accessed as needed.

The common diseases/medical conditions are malaria, upper respiratory tract infections, and skin diseases.

HIV/AIDS-Related Services

HIV/AIDS-related services provided at the barracks clinic include VCT, PMTCT, condom distribution, STI care, and treatment of opportunistic infections. Plans to expand these services are under way. About 3,000 condoms are distributed per month. These are conveniently placed at the outer gate of the barracks.

At the moment, it is unclear how the facility will get involved with HIV/AIDS control in the community, but it is a ready and willing resource.

Al Noor Clinic

The Al Noor Clinic is a large facility, owned and operated by a medical doctor. It is used by some companies as the source of medical care for their staff. The clinic has an operational VCT center. It also offers laboratory services and has a full-time laboratory technician. Patients pay full cost for care. The medical officer was away at the time of the assessment, so an interview did not take place.

Figure 4 reflects availability of STI and OI medicines in all the facilities assessed in Mariakani.

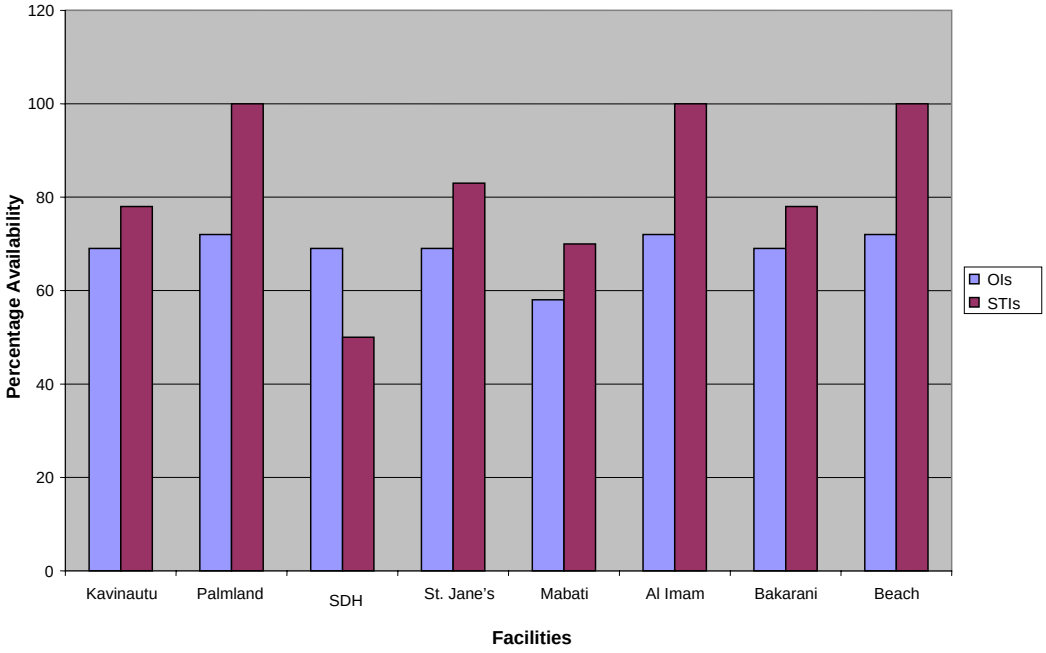

Figure 4. Availability of STI and OI Medicines

SUMMARY AND DISCUSSION

The major commodity-related impediments to providing HIV/AIDS-related health services are summarized in the following sections.

Staffing and Training

- VCT services are generally understaffed. Mariakani has no dedicated staff for VCT at the SDH; Busia District Hospital has staff, but demand for VCT is higher than the supply of counselors. Malaba's closest access to VCT services is at Teso DH, 20 minutes away by car.
- Clinicians have no training in diagnosis and treatment of OIs and little training on STIs.
- Continuing medical education is restricted to hospital settings, making it difficult for staff in health centers and dispensaries to access such educational opportunities. Also, the health care providers in the private sector need to be drawn into the larger system if the issue of drug resistance is to be addressed fully.

Selection

- Standard treatment guidelines and the essential drugs list are not available in facilities for use in selection of stock.
- Staff of health facilities do not appear to know where they can access government guidelines.

Procurement/Quality Assurance

- There is poor supplier monitoring and discipline. One supplier that facilities consistently reported as supplying substandard pharmaceuticals remains one of KEMSA's suppliers despite the complaints.

Storage and Distribution

- None of the sites assessed have methods of controlling temperature to ensure good storage conditions for pharmaceutical supplies. Power outages are common, yet most facilities do not have backup generators.
- There is poor distribution of key commodities to certain facilities. For example, Busia District Hospital's main pharmacy has been out of stock of nevirapine for more than two years, yet the KEMSA regional depot in Kakamega has the product. It is understood that the DASCOs have authority over distribution and redistribution of products to facilities that have a need.

Use/Availability/Affordability

- Pharmacies may be the first point of entry to health care for many truckers and CSWs, particularly in places with many pharmacies and qualified pharmacy staff. More STI cases appear to be seen at pharmacies than by clinicians. STIs are reported by pharmacists to be common and rising in incidence in some areas; in contrast, clinics report the opposite pattern.

- The health-seeking behavior of CSWs may differ by nationality and distance from home. CSWs are known to cross the border or go to neighboring districts to seek treatment and/or medicines to ensure anonymity and confidentiality.

- Pharmaceuticals used for treating opportunistic infections are expensive. Some facilities do not stock them for this reason, and patients have difficulty paying for some of these pharmaceuticals. Solutions to be considered to ensure availability and affordability of these pharmaceuticals include revolving drug funds and cross-subsidizing.

- Dispensing of an incomplete course of treatment of antibiotics and antiprotozoals is practiced at both pharmacies and clinics and seems to be driven by the inability of patients to afford a full course of treatment. Incomplete dosing can contribute to the development of antimicrobial resistance in a community. One solution to this may be to encourage pharmacies and clinics to dispense at least a single "start dose"—a sufficiently high dose to aggressively treat an infection. Suppliers could be encouraged to package key antibiotics to encourage dispensing in this manner.

- Free condoms appear to be available in most clinics through dispensers. Dispensers placed where clients can access the condoms discreetly seems to encourage clients to take them.

- Pharmacies do not commonly provide free condoms. They provide them for sale (around KES 10 each) or do not provide them at all.

Prescribing and Dispensing

- Prescriptions are seldom used by clinics, either due to lack of forms or because such a norm has not been established. Standardized government prescription forms do not request adequate information, and prescribers tend to leave out key information from prescriptions (such as patient sex and weight and prescriber name). This information is critical for ART prescriptions, should a facility decide to provide that service.

- With the exception of the public district hospitals assessed, facilities allow unqualified staff (with neither appropriate formal qualifications nor appropriate training) to dispense medicines. Facilities consistently exhibit poor dispensing practices (e.g., dispensing with bare hands instead of using dispensing triangles, inadequate labeling of medicines, and inadequate medication counseling).

Management Information Systems

- With the exception of a few facilities that have good record-keeping in the pharmacy, documentation of prescriptions and stock management is generally poor. Bin cards are seldom used, and registers are kept mainly for antibiotics and not for other pharmaceuticals. This leads to a dearth of the consumption data that is required for proper quantification of pharmaceutical needs.

Other Observations

- ART programs at district hospitals tend to be highly vertical, all the way to their supply management systems. There seems to be no link between pharmacies of NGO-run ART programs and GOK pharmacies. GOK staff sometimes have a difficult time obtaining up-to-date statistics on the activities and progress of these programs. VCT services seem to have a good link with the NGO-run ART clinics. There should be better links between NGO-run ART programs and the pharmacy and clinical services of the facilities that host them. Better integration of ART with the hospital operations in the beginning will facilitate later handover/scale-up.

- A number of illegal activities goes on in health facilities and pharmacies, including dispensing without prescriptions, lack of qualified staff, and lack of supervision of not-yet-qualified dispensing staff (such as pharmacy students).

Recommendations for Improving Commodity Management in Public and Private Facilities along the Northern Transport Corridor

- **Selection** of commodities should be standardized for the major HIV/AIDS-related services. All facilities should have guidelines and know what items they should stock at minimum. All facilities that provide HIV/AIDS-related services should have minimum stocks of these products. Copies of the STGs should be distributed to all facilities. There is a good case for advocating for the accreditation of facilities that are to provide comprehensive ART.

- **Procurement** of commodities should be streamlined as much as possible for public sector facilities by shortening lead times. Private sector facilities do not appear to have problems such as long lead times and substandard products. Government suppliers should be prequalified based on objective criteria, and poorly performing suppliers should not continue to receive contracts.

- There is much to be improved to ensure adequate **storage** of health commodities in Northern Transport Corridor hot spots in Kenya. Training for pharmacy staff in good storage practices, improvements in infrastructure (expansion of storage space and provision of storage equipment), and provision of equipment to control temperatures, including refrigerators, are recommended interventions.

- With respect to **distribution,** there is potential to establish uninterrupted supply chains to facilities in all hot spots. Various existing supply chains to hot spot areas already function reasonably well, whether they are run by the government (KEMSA), by NGO nonprofits (SIDA/MEDS), or by the private sector for profit (private pharmacies). For public facilities, it will be important to strengthen KEMSA's supply chain to ensure that stock-outs are minimized. This can be done by improving communication between KEMSA and its customers and by empowering facilities to collect their own medicines. It would also be worth exploring public facilities using alternative supply mechanisms, such as MEDS or local private chemists. NASCOP should clarify to DASCOs their role in distribution and redistribution of key commodities used in HIV/AIDS-related services within their respective districts.

- A number of interventions are possible to promote **rational use** of health commodities used in HIV/AIDS-related services. One is training of providers in proper diagnosis and treatment of STIs and OIs, as well as training more VCT counselors in HIV testing. It is recommended that official Government of Kenya guidelines be distributed to all health facilities currently providing or intending to provide HIV/AIDS-related services. These guidelines cover VCT, PMTCT, STI diagnosis and treatment, OI diagnosis and treatment, and home-based care. It is also recommended that the national standard treatment guidelines (for all diseases common to Kenya) be distributed to all target health facilities, as most staff at these facilities are unfamiliar with them.

- It is recommended that the standard government **prescription forms** be modified to include more complete information, and that a mechanism be put in place to ensure that all prescribers in public facilities access and use these. It is also recommended that the practice of retaining prescriptions be instituted at health facilities to allow for prescription audits to be carried out periodically.

- Pharmacy staff responsible for **dispensing** medications should be trained in good dispensing practices, and should be provided supportive supervision to reinforce their newly learned skills. Checklists, with accompanying training, can be provided to dispensers to help them take a standard approach to medication counseling.

- Partners in the Northern Transport Corridor Initiative should explore possibilities for **public/private partnerships** with private pharmacies and clinics, trucking companies, and suppliers to improve commodity management. For example, partners could build on existing arrangements trucking companies have with health facilities to provide a package of health services, including HIV-related services, to their truck driver employees. There is the potential to work with private pharmacies to educate their staffs on rational use of pharmaceuticals and standard treatments for STIs and OIs. There is also the potential to explore successful supply chains established by MEDS and other organizations to improve the availability of pharmaceuticals at public institutions.

- There is the potential to **build the capacity of public health facilities** to provide and expand HIV/AIDS-related services through training, supportive supervision, and infrastructure improvements. Facilities located immediately along the Northern Transport Corridor that

serve the target population of truck drivers and commercial sex workers include Bumala "A" and Matayos (Busia District). In places where health facilities are few (e.g., Malaba), partners could explore the creation of a facility in partnership with private sector pharmacies to ensure that a range of well-supplied HIV/AIDS-related services are available in the community. Partners should keep in mind that the target populations are also active in the suburbs of these hot spots; locating HIV/AIDS-related services immediately along the highway may not reach the majority of the target populations unless advertising and advocacy are also utilized.

ANNEX 1. SUMMARY OF FINDINGS AND RECOMMENDATIONS FROM NORTHERN TRANSPORT CORRIDOR ASSESSMENT ON COMMODITY MANAGEMENT SYSTEMS AND PRACTICES IN BUSIA DISTRICT, TESO DISTRICT, AND MARIAKANI

	Selection	Procurement	Storage	Distribution	Rational Use/ Availability	Financial Accessibility	Record-Keeping and Information Systems
Problems Identified	• Most facilities do not base selection on Kenya standard treatment guidelines or the Kenya Essential Drugs List.	• Several public sector facilities reported receiving poor-quality medicines from a specific supplier. • Procurement system at public facilities is lengthy. Lead time can be as long as four months, compared to several days in the private sector. • Inaccurate quantification of certain products has resulted in stock-outs.	• Storage of pharmaceuticals in high temperatures contributes to deterioration of pharmaceuticals and shortening of their shelf life. • Poor security of pharmaceuticals in some facilities.	• Delays in delivery of items supplied by KEMSA to facilities.	• Risk of antimicrobial resistance due to sale of suboptimal doses by private pharmacies. • Ignorance of current protocols for treating STIs and OIs and for providing ART. • Mistakes and incomplete information found in prescriptions. • Poor dispensing practices. • Patients bypass health providers and go straight to pharmacies to obtain medicines. • Stock-outs have been reported for STI medicines, test kits, and NVP.	• Medicines for treating opportunistic infections are expensive. • Many patients in these communities cannot afford to buy complete treatment doses.	• Some stock-outs can be attributed to poor record-keeping. • GOK partners do not consistently access service statistics from ART programs being run by NGOs in their own facility. • Lack of information from KEMSA on central stock levels results in wasted trips to Nairobi by peripheral facilities when they are not able to obtain all the commodities they need.

	Selection	Procurement	Storage	Distribution	Rational Use/ Availability	Financial Accessibility	Record-Keeping and Information Systems
Inhibiting Factors	• Facilities do not know where to obtain national guidelines. • Facilities do not have transportation to travel to obtain guidelines. • Facility staff have not been trained in principles of pharmaceutical selection for health facilities.	• Poor record-keeping results in lack of data for quantification. • Lack of supplier monitoring by KEMSA. • Possible lack of proper supplier prequalification. • Lack of political will to eliminate poorly performing suppliers.	• Lack of temperature control mechanisms such as air conditioning and fans. • Lack of wall thermometers for measuring ambient temperatures. • Lack of refrigerators in some facilities. • Power outages and lack of backup generators.	• Lack of transportation at public health facilities hampers their ability to collect their orders from KEMSA. • Sub-optimal distribution of commodities such as NVP. Stock available at Kakamega PGH unused while Busia DH has had stock-out for over two years.	• Lack of training in STI management. • Lack of training in management of patients with HIV/AIDS. • Lack of up-to-date reference materials (national guidelines, syndromic management charts, and standard pharmaceutical references) in health facilities. • Infrequent use of standard prescription forms. Standard government prescription forms are often out of stock, and facilities lack funds to buy them from the Government Printers. • Government prescription forms do not request sufficient information on patients. • Many dispensers are not qualified to dispense and are inadequately supervised by qualified personnel. • Poor infrastructure and equipment contributes to poor dispensing. • Long waits at public facilities and inconsistent availability of medicines cause patients to bypass medical facilities. • KEMSA's use of kit system contributes to stock-outs of STI medicines. • Poor record-keeping has contributed to NVP stock-outs.	• Low income of most inhabitants of Northern Transport Corridor sites. • Limited income-generating opportunities in Northern Transport Corridor sites. • Pharmaceutical prices are set to increase due to new 10 percent tax set by East African Customs Union.	• Lack of standardized documentation in many health facilities. • Lack of standardized procedures for documentation in health facilities. • Where records are kept, they are poorly kept and do not generate useful information for decision making (e.g., for quantification). • Bin cards are not used in many public health facilities. • Registers are used mainly to record use of antibiotics and are seldom kept for other pharmaceuticals. • Records of prescriptions are seldom kept in public and private sector pharmacies. • ART information flow is vertical and bypasses the standard GOK channels; therefore, key personnel may not be aware of what is going on in the ART programs.

	Selection	Procurement	Storage	Distribution	Rational Use/ Availability	Financial Accessibility	Record-Keeping and Information Systems
Facilitating Factors/Opportunities	• HIV-related guidelines are available in Nairobi and at DASCO offices. • National STGs are available at KEMSA and at the Pharmacy and Poisons Board in Nairobi.	• Standard GOK-issued registers for record-keeping exist. • Tools have been developed for record-keeping and stock management for ART, which can be adapted for use at other health facilities. • Most commodities mentioned in Kenya standard treatment protocols for HIV-related services are registered in Kenya.	• Training materials and curricula exist for teaching good storage practices.	• Well-functioning supply chain mechanisms, such as those used by SIDA/MEDS and MSF, already exist.	• 100 percent of GOK dispensing personnel in GOK district hospitals are qualified to dispense. • Training materials and curricula exist on good prescribing and good dispensing practices. • KEMSA has announced elimination of the kit system, although this is yet to be implemented. • NGO-run ART programs can collaborate with their GOK counterparts to strengthen capacity in government-run pharmacies. • Many private pharmacies have good availability of STI and OI medicines. • Some private pharmacies have qualified staff who have received STI training. • Some trucking companies have existing arrangements with health facilities along the Northern Transport Corridor to provide health care to staff; these options may be underutilized.	• Successful revolving drug funds are functioning at public health facilities for ART (Nakuru PGH) and for essential medicines (SIDA-supported facilities) with GOK approval.	• Standard government record-keeping tools already exist. • Standardized procedures for documentation of commodity management exist and can be adapted for hot spot facilities.

	Selection	Procurement	Storage	Distribution	Rational Use/ Availability	Financial Accessibility	Record-Keeping and Information Systems
Possible Interventions	• Distribute HIV-related guidelines to health facilities. • Distribute national STGs to all facilities. • MSH/RPM Plus can collaborate with DASCOs to conduct trainings that should accompany dissemination of standard treatment protocols.	• Provide training and supportive supervision to improve record-keeping. • Collaborate with KEMSA to explore ways of improving supplier monitoring, quality of products supplied, and lead times for receiving products. • Collaborate with KEMSA to transition from push to pull system of supply commodities. • Develop standard operating procedures for procurement for hot spot sites.	• Provide technical assistance to improve storage practices. • Partner with private industry to make infrastructure improvements to storage space. • Partner with private industry to install air conditioning in pharmacies. • Provide refrigerators for pharmacies. • Adapt standard operating procedures for storage in hot spot sites. • Provide checklists for use by staff to monitor storage practices.	• Explore partnerships with well-functioning supply chain mechanisms to improve availability and reliability of commodity supply. • Work with KEMSA and its partners to improve distribution of commodities. • Work with DASCOs to come up with formal arrangements to redistribute commodities to facilities with stock-outs (e.g., NVP in Western Province) • Explore possibilities of integrating distribution of ARVs and OI medicines into the currently well-functioning public sector supply chain for TB medicines. • Encourage and facilitate distribution of free condoms through private pharmacies.	• Revise standard government prescription forms and set up mechanism to ensure their availability in public health facilities. • Provide training and supportive supervision to improve dispensing practices. • Adapt standard operating procedures for dispensing in hotspot sites. • Provide checklists to facilities to use in dispensing. • Partner with the Kenya Medical Association and the Pharmaceutical Society of Kenya to conduct continuing education sessions for medical and pharmacy staff related to management of HIV/AIDS. • Provide relevant national guidelines and standard pharmaceutical texts to health facilities. Provide national guidelines to private pharmacies.	• Explore opportunities for implementing revolving drug funds for OI and ART medicines that are not provided free of charge. • Explore possibilities for providing subsidized STI medicines to private sector clinics and pharmacies to improve availability and rational use. • Explore possibility of distributing free condoms at private pharmacies.	• Provide technical assistance to strengthen record-keeping in pharmacies of health facilities. • Introduce use of standard prescriptions where they are not currently being used. • Adapt standard operating procedures for record-keeping in hot spot sites. • Provide training and supportive supervision to improve record-keeping practices.

ANNEX 2. OVERVIEW OF FACILITIES ASSESSED

Busia District

No.	Facility	Type	Ownership	Distance from Road
1	Busia District Hospital	District Hospital	Public/MOH	500 meters
2	Matayos Health Center	Health Center	Public/MOH	200 meters
3	Tanaka Nursing Home	Nursing Home	Private	300 meters
4	Bumala "A" Health Center	Health Center	Public/MOH	2 kilometers
5	Scorpion Pharmacy	Pharmacy	Private	100 meters

Teso District

No.	Facility	Type	Ownership	Distance from Road
1	Teso District Hospital	District Hospital	Public	1 kilometers
2	Amagoro Medical Clinic	Clinic	Private	50 meters
3	Garissa Chemist	Pharmacy	Private	50 meters
4	Scorpion Pharmacy	Pharmacy	Private	50 meters

Mariakani

No.	Facility	Type	Ownership	Distance from Road
1	Mariakani Sub-District Hospital	Hospital	Public/MOH	50 meters
2	Mabati Rolling Mills Clinic	Clinic	Private (nonprofit)	100 meters
3	Bakarani-Halima Medical Clinic	Clinic (with beds)	Private	300 meters
4	St. Jane's Medical Clinic	Clinic	Private	100 meters
5	Kavinautu Medical Clinic	Private	Private	20 meters
6	Beach Pharmacy	Pharmacy	Private	50 meters
7	Palmland Pharmacy	Pharmacy	Private	100 meters
8	Al Imam Pharmacy	Pharmacy	Private	200 meters
9	77th Battalion Barracks	Clinic (with beds)	Public/Department of Defense	2 kilometers
10	Al Noor Clinic	Clinic (with beds)	Private	300 meters

ANNEX 3. REVIEW OF PRESCRIPTIONS IN BUSIA AND TESO DISTRICTS

Criteria	Percentage of Prescriptions Fulfilling Criteria		
	Busia DH (n = 30)	Teso DH (ART program) (n = 30)	Teso DH (GOK pharmacy) (n = 30)
Date of prescription	90.0%	96.6%	63.3%
Name of patient	93.3%	100.0%	73.3%
Age of patient	6.6%	16.6%	6.6%
Sex of patient	0.0%	3.3%	3.3%
Weight of patient	0.0%	83.3%	0.0%
Medication name written in generic form	46.6%	40.0%	50.0%
Medication strength (e.g., 500 mg)	90.0%	70.0%	93.3%
Medication formulation	76.6%	30.0%	100.0%
Frequency of administration (e.g., 3 times per day)	96.6%	100.0%	96.6%
Route of administration (e.g., by mouth)	6.6%	6.6%	3.3%
Name of prescriber	10.0%	90.0%	0.0%
Signature of prescriber	90.0%	100.0%	79.7%
Number of refills	0.0%	0.0%	0.0%
Legible writing	90.0%	100.0%	96.6%
Prescription serial number	76.6%	100.0%	0.0%

ANNEX 4. AVAILABILITY OF TRACER ITEMS FOR HIV/AIDS SERVICES IN BUSIA AND TESO DISTRICTS

Facility	Percentage of Tracer Items Available			
	STIs (n = 18)	OIs (n = 29)	ARVs (n = 17)	VCT (n = 5)
Busia District				
Busia District Hospital Main Pharmacy	89%	76%	0%	80%
Busia District Hospital—MSF ART Program	56%	72%	70%	80%
Matayos Health Center	61%	69%	0%	3%
Tanaka Nursing Home	83%	83%	35%	5%
Bumala "A" Health Center	50%	45%	0%	2%
Scorpion Pharmacy—Busia	100%	83%	0%	2%
Teso District				
Teso District Hospital	78%	72%	0%	3%
Teso District Hospital—AMPATH ART Program	56%	41%	59%	4%
Amagoro Medical Clinic	72%	59%	0%	2%
Garissa Chemist	83%	65%	0%	2%
Scorpion Pharmacy—Malaba	100%	93%	0%	2%

ANNEX 5. PRICES OF TRACER COMMODITY PRICES IN TESO AND BUSIA DISTRICTS

		PRICE PER UNIT OR DOSE OF KEY PHARMACEUTICAL COMMODITIES						
		Malaba/Teso District				Busia District		
Product	**Formulation/Strength**	**Garissa Chemist - Malaba**	**Scorpion Pharmacy - Malaba**	**Amagoro Clinic - Malaba/Amagoro**	**Teso District Hospital - Kocholyia**	**Scorpion Chemist - Busia**	**Busia District Hospital**	**Tanaka Nursing Home - Busia District**
Acetylsalicylic acid	**Tablet, 300 mg**	1 Ksh each	10-20 Ksh	50 cents per tablet	20 Ksh	10 Ksh	1Ksh each	Not available
Amoxycillin	**Capsule, 250 mg**	3 Ksh each	2 Ksh	2.50 Ksh	50 Ksh	45 Ksh per dose	2 Ksh each	75 Ksh per dose
Amoxycillin	**Capsule, 500 mg**	Not available	5 Ksh	5 Ksh	Not available	Not available	Not available	Not available
Amoxycillin	**Suspension 125 mg/5ml (100ml)**	40 Ksh each	50 Ksh (generic)	40 Ksh	Free	60 Ksh	Free	150 to 100 Ksh per bottle
Amoxycillin + clavulanic acid	**Tablets (Amoxcyillin 250 mg + clavulanic acid 125 mg)**	Not available	1000 Ksh (brand) 5-day dose	80 Ksh per tab when available -- out of stock at the time of assessment	100 Ksh per dose(generic)	50 Ksh (generic) and 101 Ksh (brand) for 375 mg; 70 Ksh (generic) and 125 Ksh (brand) for 675 mg	30 Ksh	300 Ksh per dose
Erythromycin	**Tablet 250 mg**	5 Ksh	5 Ksh	4 Ksh	50 Ksh	5 Ksh	2 Ksh	250 Ksh per dose
Ciprofloxacin	**Tablet, 250 mg**	Not available	Not available	Not available	Out of stock	10 Ksh (Ciprolab)	Not available	800 Ksh per 10 day course
Ciprofloxacin	**Tablet, 500 mg**	10 Ksh	45 Ksh per tab	20 Ksh per tab	Not available		Not available	
Cotrimoxazole	**Tablet, 400 mg**	20 Ksh per full dose	5-20 Ksh for full dose	40 Ksh	20 Ksh per full dose	1 Ksh each	1 Ksh each	50 Ksh for syrup
Condoms	**Each**	Not available	10 Ksh (Trust and Ugandan brands)	Free from dispenser	Free	10 ksh each	Free to youth groups	Free
Dextrose	**Inj 5% W/V 500 ml**	40 Ksh per bottle	45 Ksh	80-100 Ksh	30 Ksh per bottle	50 Ksh	70ksh	70 Ksh per bottle
Doxycycline	**Capsules, 100 mg**	50 Ksh per dose	4-5 Ksh	4 to 5 Ksh each	20 Ksh per full dose	4 Ksh each	2 Ksh each	Not available
Gentamicin	**Inj 80 mg/2ml; 20 mg/2ml**	5 Ksh per amp	5 Ksh per amp	10 Ksh	30 Ksh per injection	4 Ksh per amp	Not available	Not available
Gloves (latex)	**Pair**	10-30 Ksh per pair	20 Ksh per pair	20 Ksh per pair	Not available	10 Ksh per pair	Not available	Not available
Metronidazole	**Tablet, 200 mg;400 mg**	20 Ksh max	30 Ksh per dose	40 Ksh	20 Ksh per full dose	50 cents per tablet	1 Ksh each	150 Ksh per dose
Nystatin	**Oral drops, 100,000 IU/ml (24 ml)**	60 Ksh	50 Ksh	40 Ksh	20 Ksh per full dose	70 Ksh	Free	50 Ksh per bottle
Oral rehydration salts	**Sachet**	10 Ksh	10 Ksh	10 Ksh	Free	10 Ksh	Free	10 Ksh
Paracetamol	**Suspension 120 mg/ml**	30 Ksh	25 Ksh	20 Ksh per 100 ml	Free	25 Ksh for 60 ml	Free	Out of stock
Paracetamol	**Tablets, 500 mg**	50 cents per tablet	10-20 Ksh	1 Ksh	20 Ksh per full dose	50 cents per tablet	50 cents per tablet	20 Ksh
Procaine Penicillin	**Vial 800,000 MU**	25 Ksh per vial	25 Ksh per vial	40 Ksh	30 Ksh per vial	25 Ksh per vial	Not available	35 Ksh
Tinidazole	**Tablets, 500 mg**	25 Ksh for pack of 4	52 Ksh for pack of 4	100 Ksh per pack of 4	20 Ksh per full dose (pack of 4)	20 Ksh per pack of 4	7.5 Ksh each	Not available
One month supply of adult 1st line regimen of ARVs: 3TC+d4T+NVP		Not available	Not available	Not available	Free through AMPATH ART program	Not available	Free through MSF ART program	Have not yet started ART program, but will charge at least the buying price when program begins*
One month supply of adult 1st line regimen of ARVs: 3TC+d4T+EFV		Not available	Not available	Not available	Free through AMPATH ART program	Not available	Free through MSF ART program	Have not yet started ART program, but will charge at least the buying price when program begins*

*** Buying prices of ARVS for Tanaka Nursing Home**

NVP 200 mg =1000 Ksh for 60s

NVP suspension = 475 Ksh for 100 ml

EMTRI 40 = 1980 Ksh for 60s

EMTRI 30 = 1980 ksh for 60s

Stavudine 40 = 370 Ksh for 60s

ANNEX 6. OBSERVATION OF DISPENSING ENCOUNTERS IN BUSIA DISTRICT

Criteria	Dispensing Encounters		
	Matayos HC (n = 10)	Busia DH (n = 10)	Total (n = 20)
Name of medication	4	3	35%
How often to take meds	10	10	100%
Side effects	1	0	2%
Taking meds in relation to meals	7	3	50%
Drug-drug interactions	0	0	0%
Explanation of how meds work	0	0	0%
Assessment of patient's understanding of instructions	5	5	50%
Average length of encounter	61 seconds	127 seconds	94 seconds
Where dispensing done	Window	Window	—
Labels adequate	No	Information not available	—
How dispensing done	Hand	Hand	—